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MEDICAL BOTANY.

MEDICAL BOTANY;

OR,

ILLUSTRATIONS AND DESCRIPTIONS

OF THE

Medicinal Plants

OF THE LONDON, EDINBURGH, AND DUBLIN PHARMACOPŒIAS;

COMPRISING

A POPULAR AND SCIENTIFIC ACCOUNT OF

POISONOUS VEGETABLES

INDIGENOUS TO GREAT BRITAIN.

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BOTANICAL SOCIETY OF LONDON.

NEW EDITION.

EDITED BY

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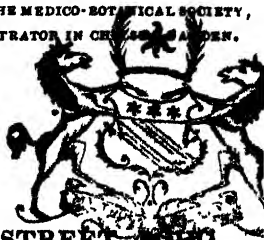
PROFESSOR OF BOTANY IN KING'S COLLEGE, LONDON; TO THE MEDICO-BOTANICAL SOCIETY,
AND TO THE SOCIETY OF APOTHECARIES; AND DEMONSTRATOR IN CHARGE OF THE GARDEN.

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A D D R E S S .

THE Authors and Publisher of Medical Botany have once more the satisfaction of bringing their work to a successful termination, and they tender their grateful acknowledgments for the patronage they have obtained.

It has been a source of high gratification to the Authors, that their work has been so favourably received as to have succeeded to the place in Public estimation which "Woodville's" occupied for so many years.

Soon after the first edition was completed, every copy was disposed of, and both the Authors having left London, Professor Burnett was engaged to conduct the present edition through the press. From the care and expense bestowed on the former, little remained to be done, as will readily appear on a comparison of the two ; such emendations, however, as seemed necessary, were made by Professor Burnett both in the Plates and Letter-press, up to the close of the Second Volume, when that estimable man was removed by death. The remaining portion of the work has been brought out under the careful superintendence of Mr. Churchill, of Colchester, Essex.

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LAURUS SASSAFRAS.

Sassafras Laurel.

SPEC. CHAR. *Leaves* ovate, entire, two or three lobed.

Syn.—*Sassafras sive lignum peruanum.* Bauh. Hist. 148. 3.

Sassafras arbor ex Florida, sculneo folio. Bauh. Pin. 431.

Sassafras. Ger. Em. 1528; Mark. 1606, Ran. Hist. 2. 1568.

Cornus mas odorata, folio trifido, margine plano Sassafras dicta. Pluk. Alm. 120 t. 222, Cat. Carolin. 1. t. 55.

Laurus Sassafras. Sp. Pl. Willd. 2. p. 348; Woodv. t. 31, Bigelow Amer. Med. Bot. t. 38.

FOREIGN—*Laurier Sassafras*, Fr; *Sassafras*, Port.; *Sassafrasbaum.* Ger, *Hoam Cham*, Chin., *Cay Vaug des.* Cochin China.

THE Sassafras Laurel is a native of North America, inhabiting every latitude from New England to Florida; and is also said to be found in Cochin China, and in the forests of Mexico and Brazil. It is perfectly hardy, bearing the severity of our northern climate, and is sometimes planted in gardens as an ornamental tree. There is a fine Sassafras tree in the royal garden at Kew; and our figure was taken from a specimen growing in the nursery of Mr. Lee, at Hammersmith.

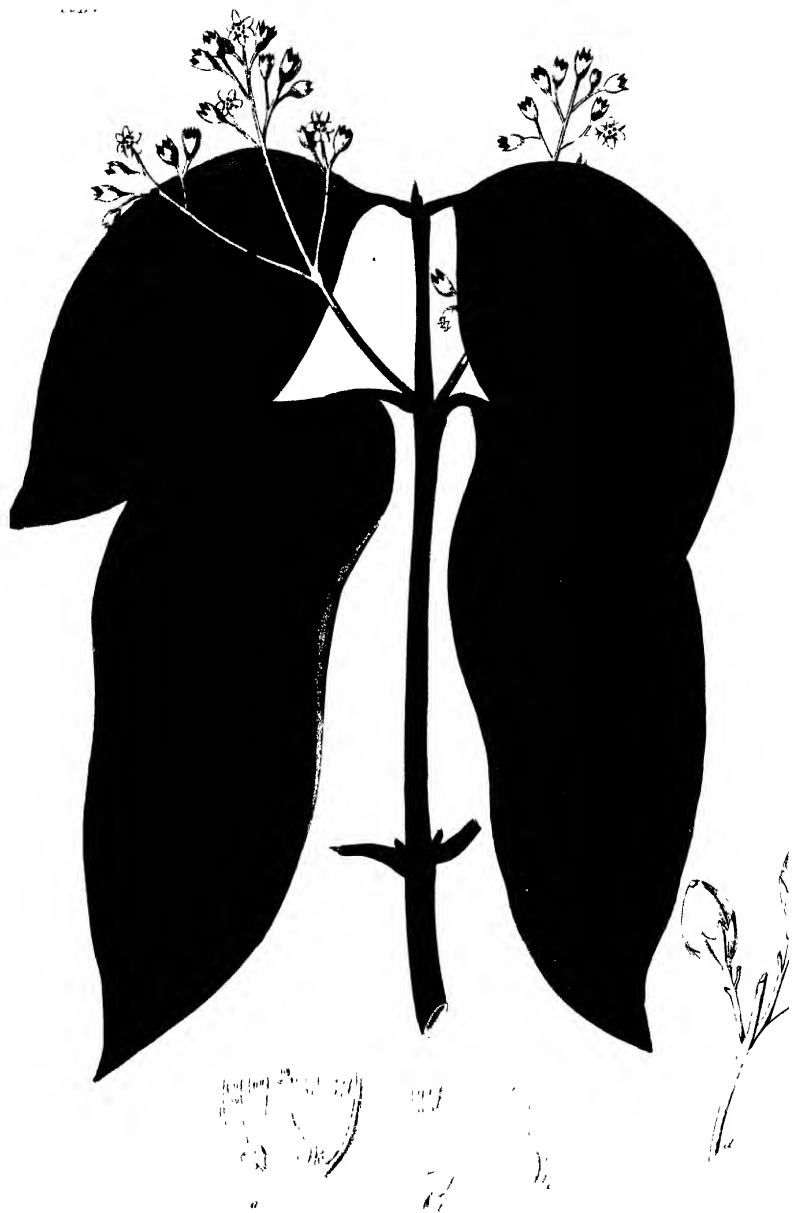
The Sassafras tree of the United States, according to Dr. Bigelow, grows, in favourable situations, to a tall stature and large circumference. The bark of the trunk is much cracked and of a greyish colour; but the young twigs are of a reddish green. The leaves are remarkable for the variety of their form on the same tree; those which proceed first from the bud being oval, entire, and about four inches long; the next of the same form with a lobe on each side, while the last have regularly three lobes. They are alternate, of a bright green colour, petioled, downy when young, but become smoother by age. The blossoms, which appear in May and June, immediately under the leaves before they begin to evolve, are small, of a pale green colour, and disposed in short pendent panicles. The flowers are often imperfect as to the parts of fructification, which has led to the

conclusion that different trees produce male and hermaphrodite flowers; but it has been lately ascertained, that the alleged males are only imperfect hermaphrodites. The perianth is single and petaloid, and divided into six narrow, greenish-white segments; the filaments are short, bearing heart-shaped anthers; the germen is roundish with a simple style. The fruit is an oval drupe of a deep blue colour, supported on a red incrassated peduncle, nearly two inches in length.

QUALITIES.—The bark of this tree has a fragrant smell, and a very agreeable spicy taste. The flavour of the root is most powerful, that of the branches more pleasant. The flavour and odour reside in a volatile oil, which yielded by distillation, is the heaviest of volatile oils; it is of a light colour, becoming darker by age, and is very pungent. The bark and pith of the young twigs abound with a pure and delicate mucilage. A very small quantity of the pith infused in a glass of water, gives to the whole a ropy consistence like the white of an egg. This mucilage has the uncommon property of not being precipitated, coagulated, or rendered turbid by alcohol.

MEDICAL PROPERTIES AND USES.—The bark and wood of this tree were formerly much celebrated in the cure of syphilis, rheumatism, and dropsy. It is now, however, only prized as a warm stimulant and diaphoretic, although it still enters as an ingredient into the “compound decoction of sarsaparilla,” formerly called the “Lisbon diet drink,” which, useful as a sudorific in rheumatism and some cutaneous diseases, derives more efficacy from its other ingredients than from sassafras. The essential oil, mixed with water, may be given in small quantities as an antispasmodic, stimulant, and sudorific; and the mucilage is much used in America, in dysenteric, catarrhal and calculous affections; also as an external application in the inflammatory stages of ophthalmia.

OFF. PREP.—*Oleum Sassafras*. L. E. D. *Decoctum Sarsaparillæ comp.* L. D. *Decoctum Guaiaci*. L. E. D. *Aqua Calcis com.* D.



Taurus Cinnamomum

LAURUS CINNAMOMUM.

The Cinnamon-tree.

SPEC. CHAR. *Leaves* nearly opposite, ovate-oblong, 3-nerved; lateral nerves vanishing towards the end. *Panicles* repeatedly compound; petioles smooth.

Syn.—*Cinnamomum* sive *Canella* Zeylanica. *Bauh.* Pin. 408.

Canella seu *Cinnamomum* vulgare. *Bauh. Hist.* 1446.

The Cinnamon-tree of Ceylon. *Raii Hist.* 1561.

Arbor canellifera Zeylanica, cortice acerrimo seu prestantissimo, qui cinnamomum officinarum. *Breyn. Prod.* 2. 17.

Cassia cinnamomea sive *Cinnamomum*. *Herm. Lugd. Bat.* 129. t. 655.

Cinnamomum foliis latis ovatis frugiferum. *Burm. Zeylan.* 62. t. 27.

Karna. *Rheede Malab.* 1. p. 107. t. 57.

Kurindumpon, *Dios.*

Laurus Cinnamomum. *Lin. Sp. Pl.* 328.; *Willd.* 2. p. 477; *Blackw. Herb.* t. 354; *Jacq. Amer.* p. 59. t. 117; *Plenck. Icon.* 312; *Gertn. Sem.* 2. 69; *Bet. Repos.* 596; *Bot. Mag.* t. 2028; *Woodv.* 1. 80. t. 27; *Nees ab Essenh. Diss. de Cinnam.* t. 1; *Lamarck Ency.* 3. p. 441; *Persoon Syn.* 1. p. 448; *Stokes.* 2. 412.

FOREIGN.—*Le Canellier*; *La canelle*, Fr.; *Canella*; *Albero della canella*, It.; *Canela*; *Arbol de la Canela*, Sp.; *Canella vulgar.* Port.; *Der Zimmet*, *Der Kaneel*; *Zimmetbaum*, Ger.; *Dar-cheeni*. Beng.; *Kura puttay*, Tam., *Kurundu potto*, Cing.; *Dar Chinie*, Hind.; *Cay que*, Coch. Chin.

LAURUS CINNAMOMUM, the bark of which yields the well known spice cinnamon, is a native of Ceylon, but it is cultivated in other parts both of the East and West Indies. Cinnamon seems to be confined to the torrid zone, or at least we have no good authority for supposing that it flourishes much beyond it. Spielman says, it is found in Tartary, and many authors have asserted that it grows in China. Spielman's assertion is now supposed to be incorrect; and Sir G. Staunton tells us that, with the exception of the camphor-tree, none of the laurel genus grows in China; nor does Osbeck include it in his "Flora Sinensis." It grows abundantly on the Malabar coast; the island of Sumatra, particularly about the Bay of Taponooly; Cochin China; Tonquin, where it is an article of Royal monopoly; the Sooloo; Borneo; Timor; the Nicobar and Philippine islands; the island of Floris, and Tobago. It has been culti-

vated in the Brazils, the isles of Bourbon and Mauritius, the Seychelle islands, Guadeloupe, Jamaica, and the northern Circars. The cinnamon plant was introduced into Guiana, in the year 1772, from the isle of France; subsequently it was transported into the Antilles. In Guiana the inhabitants cultivate it in their gardens, and round their cottages. They prepare cinnamon sufficient for domestic purposes, and transmit a small quantity to France. Prior to the year 1790, it was introduced into Cayenne by the French government at a very great expense, and recommended to be cultivated by the colonists; cinnamon has been successfully grown in the island of Dominica by a M. Buée, where the same gentleman has succeeded in propagating the clove-tree. The cinnamon-tree has long been known in this country, and was cultivated by Mr. Philip Miller in 1768. The Bishop of Winchester, many years since, raised it from seeds ripened in his own hot-house, at Farnham in Surrey. With us it must be kept constantly in the stove. In its native soil and climate, the cinnamon laurel flowers in January and February, and the fruit ripens in June, July, and August.

"The soil of the cinnamon garden in the neighbourhood of Colombo is a remarkable instance of the silicious kind. The surface of the ground in many places where the cinnamon plant flourishes, is white as snow; this is pure quartz-sand. Below the surface a few inches, where the roots penetrate, the sand is of a grey colour. A specimen of this, dried thoroughly, was found to consist of

98	5	Silicious sand,
1	0	Vegetable matter,
0	5	Water.

100 0

It may appear surprising that the cinnamon plant should succeed best in so poor a soil; but, other circumstances considered, it admits of explanation. The garden is nearly on a level with the lake of Colombo, its situation is sheltered, the climate is remarkably damp, showers are frequent, the temperature is high and uncommonly equable. These are the principal peculiarities to which the excellence of the cinnamon, and the luxuriant growth of this valuable shrub, in a soil apparently so unpromising, may be justly attributed."

Captain Percival, in his history of Ceylon, confirms the narrative of Dr. Davy.

The fullest account of the cinnamon-tree, and of the preparation of cinnamon, that we have seen in the English language, is by Henry Marshall, Esq., Staff Surgeon to the Forces in Ceylon, and the following details respecting the natural history and description of this valuable spice, is principally derived from his interesting paper, published in Thomson's *Annals of Philosophy*, vol. x. p. 241 and 346. The tree grows to the height of from 20 to 30 feet; has a slender trunk, from 12 to 18 inches in diameter, irregular, knotty, and covered externally with an ash-coloured, thick, rough, scabrous bark; innumerable branches shoot from the stem and give it the appearance of the Portugal laurel. The wood is light and porous like that of the osier, and is used for fuel. Shoots spring up from the roots in great profusion, and form a bush round the stem. The inner bark is reddish. The bark of the young shoots is often beautifully speckled with dark green and light orange colours. The root and branches exude abundance of camphor. The leaves, which stand in nearly opposite pairs on short slightly channelled petioles, are from six to nine inches in length, oblong, smooth, pointed, entire, and three nerved; the lateral nerves vanishing as they approach the point. The young leaves and tender shoots are of a bright red or liver colour, with yellow veins; the former as they acquire maturity become olive, then bright green, and before they fall olive yellow; mature leaves have a strong aromatic odour, and the biting hot taste of cloves. The flowers are in axillary and terminal panicles, white, inodorous, or perhaps somewhat fœtid. The petals are six, ovate, pointed, concave, and spreading; the filaments are in threes, shorter than the corolla, flattish, erect, the three innermost glanduliferous at the base, and the anthers are double. The fruit is an oval berry, larger than a black currant; when ripe, the skin is bluish-brown, thickly scattered with spots; beneath the skin is a greenish pulp, which is slightly acrid, has a terebinthinate odour, and a taste resembling that of the juniper berry. This pulp incloses a nut, which contains an oily, soft, pale rose-coloured, inodorous kernel. Crows and wood-pigeons devour the berries with great avidity; the productive quality of the seeds remains undestroyed,

and by this means the plant is disseminated over a great extent of country, and is found even in the thickest and most impassable jungles.—Fig. (a) represents a section of a flower magnified; (b) a stamen with its gland at the base; (c) the germen and style; (d) the fruit.

Cinnamon is mentioned, Exod. xxx. 23, among the materials which composed the holy anointing oil; and in Prov. vii. 17, Cant. iv. 14, Eccles. xxiv. 15, and Rom. xviii. 13, amongst the richest perfumes. Our species of cinnamon is brought from the East Indies; but as there was no traffic with India in the days of Moses, it was probably obtained from Arabia, or some neighbouring country. We learn, also, from Pliny, that a species of it grew in Syria. “In Syria gignitur et cinnamomum quod caryopon appellant. Hic est succus nuci expressus multum a surculo veri cinnamomi differens vicina tamen gratia.”—Nat. Hist. l. xii. c. 38.*

Dr. Marshall, whose valuable contributions were published in the Annals of Philosophy, thinks it probable, that from the earliest ages Europe has been indebted to Ceylon for part of its supplies of this article. He thinks that it may have been exported by small vessels belonging to the island, to the Malabar coast, and from thence to Sabea, on the south coast of Arabia, by the Arabs. Here the ships belonging to the merchants of Phœnicia and Egypt found large stores of the produce of India; and by this medium the demands from all Europe were supplied. The enormous expense incurred by transporting cinnamon such a circuitous route, must have greatly enhanced its price and prevented its very general use. On some occasions, however, the quantity consumed was considerable. At the funeral of Sylla, 210 burthens of spices were strewed upon the pile; and it is probable that cinnamon formed a great part of the spices used on this occasion, the produce of the Moluccas being then but little, if at all, known to the Romans. Nero is reported to have burned a greater quantity of cinnamon and cassia at the funeral of Poppœa than the countries from which it was imported yielded in one year.

In 1498 Vasco de Gama landed at Calicut. Indian commerce now took a different route, and the Portuguese supplied Europe with the articles which had formerly passed through the hands of the Venetians. Eager to engross the cinnamon trade, the Portuguese, early in the sixteenth century, arrived at Ceylon, and obtained leave to establish a factory, which led to the erection of the fort of Colombo. Shortly after the fort had been built, they concluded a treaty with the king of Kandy, wherein he agreed to furnish them annually with 124,000 pounds of cinnamon, in return for which they were to assist the king and his successors, both by sea and land, against all his enemies. The thriving

* Salmasius has shown from the authority of MSS., that *camacon*, or *comacon*, is here to be read for *caryopon*. In Solinum, p. 922.

settlements of the Portuguese in the East, eventually attracted the attention of the merchants of Holland. Soon after they had gained a footing in India, they became anxious to engross the cinnamon trade, and early in the seventeenth century found means to ingratiate themselves with the king of Kandy, who invited them to aid him in expelling the Portuguese from the islands. In 1612, the king engaged to deliver to the Dutch East India Company all the cinnamon he was able to collect. Peace was concluded between the Portuguese and Dutch in 1644. By this treaty a moiety of the trade was ceded to the Dutch. War commenced again in 1652. Colombo surrendered to the Dutch in 1656, and Jaffna, the last place of strength of the Portuguese, fell in 1658. After monopolizing the trade for many years, during which time they extirpated the trees in Malabar to enhance the value of the cinnamon of Ceylon, the Dutch found serious rivals in the Chinese, whose cinnamon is inferior to none. To check, therefore, this rivalry, and to render themselves independent of the king of Kandy, they began to cultivate the cinnamon on their own ground at Ceylon; and Dr. Thunberg, who visited Ceylon in 1778, informs us, that by the unwearied exertions of Governor Falck, exceedingly large plantations of cinnamon had been formed, and that the shoots of some of the early plantations had been already three times barked. Political altercations between the colonial government and the court of Kandy occurred about 1792, during which the peeling of cinnamon in the king's territory was greatly interrupted, and the governor declined to send an ambassador to obtain leave, as the king of Kandy required. By the year 1793, the propagation of the cinnamon plant had so far succeeded, that the governor was enabled to furnish the annual investment from the territory of the company, and in a letter to his successor, he congratulates him, that, in future, they would not be under the necessity of flattering the court of Kandy. Ceylon was reduced by a British force in Feb. 1796, and in the latter end of 1797, 13,893 bales of cinnamon were sent to this country. By the treaty of Amiens, concluded in 1802, the Batavian republic ceded to his Britannic majesty all their possessions in the Island of Ceylon, which belonged before the war to the United Provinces. Soon after our countrymen became possessed of Ceylon, they became infected with the Dutch mania, and such serious alarm did they entertain that the market would be overstocked with cinnamon, the produce of the island, that the government, anxious to keep up its price, ordered many of the plantations to be rooted up. In July 1805, General Maitland assumed the government of Ceylon, and one of his first acts was to arrest the destruction of the plantations. He readily saw the propriety of encouraging and increasing the cultivation of cinnamon, and adopted means which have been followed with success. During this government, the annual investments continued gradually to increase, and many hundred acres of new ground were planted. Less dependence was now placed on the supply from the Kandian territory, which was always uncertain and subject to many impediments. To rival the excellence of the cultivated cinnamon of Ceylon, Dr. Marshall thinks it probable that the Dutch will cultivate it in Java, or some of its dependencies, and he strongly urges the propriety of exerting the powerful means, which circumstances have placed in our power, to cultivate, collect, and export

a greatly increased quantity of this spice with the view of supplying the markets both of Europe and America ; while the trade will be rendered less profitable to our rivals, and less encouraging to them to attempt to monopolize the commerce of this important article.

“ The ground for planting cinnamon is in the first instance prepared, by cutting down the low brushwood and young trees. The lofty trees are allowed to remain, as the cinnamon is observed to thrive better under their shade, when not too close, than when it is exposed to the direct rays of the sun. The brushwood is collected into heaps, and burned. The planting commences when the seeds are ripe, generally during the months of June, July, and August. The workmen stretch a line upon the ground, along which they with a mammettee (hoe) turn up about a foot square of earth, at intervals of six or seven feet. The ashes of the burned shrubs and branches of trees are then spread upon the spots of friable earth ; and into each of them four or five cinnamon berries are planted with a dibble. Branches of trees are spread upon the ground, to prevent the friable earth from being scorched, and to protect the young shoots. The young shoots appear above the ground in about fifteen or twenty days. Sometimes the berries are sown in nurseries, and the shoots transplanted in the months of October and November.

“ In favourable situations the shoots attain the height of five or six feet in about six or seven years ; and a healthy bush will then afford two or three shoots fit for peeling. Every second year from four to seven shoots may be cut from a bush in a good soil. Thriving shoots of four years' growth are sometimes fit for cutting.

“ As four or five seeds are sown in one spot, and as in most seasons many of the seeds germinate, the plants grow in clusters, not unlike a hazel bush. In seasons with little rain many of the seeds fail, and a great number of the young shoots die ; so that it is frequently necessary to plant a piece of ground several times successively. A plantation of cinnamon, even on good ground, cannot be expected to make much return before eight or nine years have elapsed. The plantations from which a considerable part of the cinnamon is procured are Kaderang, Ekele, Marendahn (Colombo), and Morotta. These are styled protected plantations, to distinguish them from a number of extensive fields that were planted with cinnamon by the Dutch, and which have since been permitted to be overrun with creepers, brushwood, &c. and many of the cinnamon plants rooted up by the natives.”

“ On an average of ten years the quantity of cinnamon deposited annually in the magazine at Colombo from the jungles and abandoned plantations of our own territory, including what has been collected in the Candian country, amounts to 1184 bales ; and at Galle, during the same period, 935.

“ The peeling commences early in May, and continues until late in October. The rains which precede, and occur during the southwest monsoon, produce such a degree of succulency in the shoots as to dispose the bark and wood to part easily. The setting in of the rainy weather immediately produces a fresh crop of scarlet or crimson-coloured leaves.

“ The cinnamon harvest begins by dividing the peelers into small

parties, which are placed under the directions of an inferior superintendent. When they are to peel in the plantations, each party has a certain extent of the plantation allotted to it. A few of the party cut shoots; while the remainder are employed in the wadu (or peeling shed) to remove the bark and to prepare the cinnamon. When the chaliah perceives a bush with shoots of a proper age, he strikes his ketta (which resembles a small bill-hook) obliquely into a shoot; he then gently opens the gash, to discover whether the bark separates easily from the wood. Should the bark not separate easily, the shoot or branch is not deemed fit for cutting. The chaliahs seldom trust implicitly to any external mark of the proper condition of the plant, and rarely try a shoot until the scarlet leaves have assumed a greenish hue. Some plants never acquire a state fit for decortication. Shoots of many years' growth often bear the marks of numerous annual experiments to ascertain their condition. Unhealthy, stunted plants, are always difficult of decortication; and the cinnamon procured from them is generally of an inferior quality.

"The peelers do not cut shoots or branches whose diameter is much less than half an inch, or more than from two to three inches.

"To remove the bark, the peeler commences by making with his kokette, or peeling knife, through the bark, a longitudinal incision, of which the length is determined by the figure of the shoot. A similar incision is made on the opposite side of the shoot, and when the branch is thick, the bark is divided in three or four places. The kokette is next introduced under the bark, which is gradually separated from the wood, and laid aside. When the bark adheres firmly to the wood, the shoot is strongly rubbed with the handle of the kokette. These sections of bark are carefully put one into another, the outer side of one section being placed in contact with the inner side of another, and are then collected into bundles, and firmly pressed or bound together.

"In this state the bark is allowed to remain for twenty-four hours, or sometimes more: by which means a degree of fermentation is produced that facilitates the subsequent operation of removing the cuticle. The interior side of each section of bark is placed upon a convex piece of wood, and the epidermis, with the greenish pulpy matter under it, is carefully scraped off with a curved knife. During the operation the peeler sits upon the ground, and keeps the bark steady upon the piece of wood with his heel or toes. The bark dries, contracts, and gradually assumes the appearance of a quill or pipe. In a few hours from the time the cuticle is removed, the peeler commences to put the smaller tubes into the larger, and introduces also the small pieces. By this means a congeries of quills is formed into a pipe, which measures about forty inches long. The cinnamon is suspended in the wadu upon open platforms for the first day. The second day it is placed in the sun, on wicker shelves, to dry. When sufficiently dry, it is collected into bundles of about thirty pounds weight each, and in this state deposited monthly in the government magazines at Colombo or Galle.

"When newly prepared, cinnamon has a most delicious odour: this odoriferous quality becomes gradually fainter. Cinnamon is at

first of a light-orange colour, which becomes a shade darker by exposure to the air. The bark of old trees acquires a reddish-brown colour.

“ Shortly after the cinnamon is deposited in the storehouses, the inspection of it commences. The East India Company employ an inspector and two assistants to superintend the sorting and baling of the cinnamon. The manipulation is performed by natives. Each bundle is placed on a table or large bench; the bundle is untied, and the cinnamon examined quill by quill. It is divided into a first, a second, and a third, or rejected sort. The first and second sorts are alone deemed of a quality fit to form the Company's investment. The sorting of cinnamon consists chiefly in detecting or separating what is coarse, and otherwise of a bad quality, including the impositions of the peelers. This is chiefly performed by inspection. Habit soon enables the people employed to discover by a single glance of the eye what is considered defective. Tasting is very rarely had recourse to.

“ The bark of the large shoots, or thick branches of trees, produces coarse cinnamon, which is generally rejected by the sorters. This cinnamon is thick, and has a reddish-brown colour, rough surface, loose texture, and is coarse-grained. It breaks short, shivery, and crumbling. When chewed it is disagreeably pungent, feels gritty, ligneous, and sandy, in the mouth.

“ The peelers occasionally scrape off the external pellicle of this quality of cinnamon. This operation thins the cinnamon and improves the colour, but leaves it with a coarse, rough surface. This quality of cinnamon is always rejected.

“ Cinnamon prepared from the bark of very young and succulent shoots is rejected. It is light straw-coloured, thin, and almost without flavour or taste; and what little aroma it possesses is very evanescent.

“ Mildewed or half-rotten and smoky cinnamon is rejected. When the peelers are overtaken with rain at a distance from sheds, the bark they have previously collected ferments, becomes decayed, and inodorous. In such situations they frequently retire to caves, or very confined huts, where they kindle fires, to procure warmth and to dress their food. The smoke arising from these fires often greatly injures the bark, and renders it unfit to be manufactured into good cinnamon. To increase the weight, the peelers sometimes stuff the quills of cinnamon with sand or clayey earth, thick ill-prepared pieces of bark, &c. &c. When these impositions are suspected, the quills are undone, often broken, and the foreign mixtures removed.

“ This is one of the many causes which prevents the cinnamon from being in quills of nearly equal length. Cinnamon produced beyond the river Keymel on the north, and the Wallawey on the south, is generally condemned. It is light-coloured, greatly deficient in aromatic flavour, astringent, bitter, and has sometimes a taste similar to the rind of a lemon. Even between these limits the cinnamon produced differs greatly in quality. Differences of soil, and exposure, are very evident causes of a difference in the quality of cinnamon. Shoots exposed to the sun are more acrid and spicy than the bark of those which grow under a shade. A marshy soil rarely affords good

cinnamon. It has often a pale yellow shade, approaching to the colour of turmeric. It is loose, friable, and gritty, and its texture coarse-grained. It possesses little of the spicy taste of cinnamon. Very often, however, the cause of the inequality of this spice is not apparent; the bark of different shoots of the same bush have often very different degrees of spiciness.

"That which is considered in Ceylon as of the best quality is of a light, yellow colour, approaching nearly to that of Venetian gold; thin, smooth, shining; admits of a considerable degree of pressure and bending before it breaks; fracture splintery; has an agreeable, warm, aromatic flavour, with a mild degree of sweetness. When chewed, the pieces become soft, and seem to melt in the mouth.

"The first and second sorts are weighed, and put up into bundles, each weighing 92½ lbs. English. Each parcel or bale is firmly bound round with ropes, and then put into double gunnies.

"The outside of the bale is marked with the number of the quality of the cinnamon, and the initial letter of the name of the protected plantation from whence it is procured. The bales of cinnamon which are procured in the neglected plantations, the woods of our own territory, or in the Candian country, are marked A. G. (Abandoned Gardens.) The Company export their cinnamon from Colombo, or Galle, and the interstices between the bales are filled with black pepper."

"On some occasions the Ceylon government has directed oil to be extracted from the cinnamon, whose quality did not permit it to form part of the Company's investment. The process is simple: the bark is grossly powdered, and macerated for two days in sea-water, when both are put into the still. A light oil comes over with the water, and swims upon its surface, and a heavy oil, which sinks to the bottom of the receiver. The light oil separates from the water in a few hours; but the heavy oil continues to precipitate for ten or twelve days. The heavy oil, which separates first, is about the same colour as the light oil; but the portion which separates last has a browner shade than the supernatant oil. In future distillations the saturated cinnamon-water is advantageously used, added to sea-water, to macerate the cinnamon. Eighty pounds of newly-prepared cinnamon yield about two ounces and a half of oil, which floats upon the water, and five ounces and a half of heavy oil. The same quantity of cinnamon, if kept in store for several years, yields about two ounces of light oil, and five ounces of heavy oil."

"The word *cassia* is by modern authors used in a variety of senses; but as they do not always define it, or explain the specific nature of the substance they intend to describe, it is often difficult to know what meaning they attach to the term, or to comprehend the nature of the article concerning which they have been writing.

"This makes the subject extremely embarrassing. It is, however, very generally used in one or other of the three following ways. 1. To denote the prepared bark of the *laurus cassia*. 2. To specify the cinnamon procured from thick shoots, or large branches of the cinnamon-tree, employing it as synonymous with the appellation coarse cinnamon. 3. To distinguish the produce of the *laurus cinnamomum* found in various countries, from the cinnamon produced in Ceylon.

"With regard to the first specification, it is sufficient to mention that *Laurus Cassia*, dawul kurundu, has been already described, and the distinction between it and the *Laurus Cinnamomum* pointed out. It is never decorticated. As to the second, it is well known that the rejected cinnamon, or third sort of that prepared in Ceylon, has been imported into England, and sold under the denomination of cassia.

"The third specification seems to be founded on a supposition that the *Laurus Cinnamomum* found out of Ceylon is not equal to that which is produced in the island."

The true cinnamon of commerce, according to Mr. Marshall, is the produce of young shoots of the cinnamon-tree (*Laurus Cinnamomum*;) and cassia is the prepared bark of the *old branches of the same kind of tree*. Cassia is harder, and more woody than cinnamon. The ancients made use of this kind of bark; but we at present reject it.*

The *cassia bud* of commerce is the fleshy hexangular receptacle of the seed of the *L. Cinnamomum*. When gathered young the receptacle completely envelops the embryo seed, which progressively protrudes, but is continually embraced by the receptacle. The buds have the appearance of nails, with roundish heads of various sizes. If carefully dried, the receptacle becomes nearly black, and the point of the berry light brown. The seeds contract by drying, and often fall out; the receptacle is then cup-shaped. When kept long, they have a dirty brown colour, and possess very little of the flavour of cinnamon. By distillation they yield an essential oil not inferior to that of cinnamon bark.

QUALITIES AND CHEMICAL PROPERTIES.—Cinnamon bark has a reddish brown colour, and consists of long rolled pieces which splinter when broken. It has a pleasant aromatic smell, and a pungent but agreeable taste. Its properties are entirely

* The following is Mr. Marshall's description of the *Laurus cassia* of Lin., or Bastard Cinnamon-tree, which abounds in many parts of Ceylon, and is called *dawul kurundu* by the Cingalese. "The trunk is branchy and crooked; leaves ovate-lanceolate, entire, from four to six inches long, and from one to two inches broad; three-nerved; the lateral nerves terminate before they join the middle one; above the petiole smooth, alternate; upper surface dusky green; under surface pale grey; petiole half cylindrical; flat above; flowers inodorous, whitish, verticillated, sessile; calyx common 4-leaved; leaves roundish, concave; contains five distinct flowers with short peduncles; corolla 6-petalled, ovate-concave, nearly equal; filaments nine, shorter than the corolla; style short, stigma obtuse; berry black, round, and about the size of a large currant. The bark of the root is extremely bitter; the leaves of the bark of the trunk and branches are bitter, and have, in a very slight degree, the taste and odour of myrrh. This is the *canella de matto* of the Portuguese, the wild caneel of the Dutch, and the *laurus myrrha* of Louriero." It is figured in Nees von Esenbeck's "*Dissertatio De Cinnamomo*," t. 3, published at Bonn in 1823, and in the *Botanical Magazine*, t. 1636.

owing to its volatile oil. This oil has a whitish yellow colour, and an extremely pungent taste and smell. It may be separated by infusing the bark in alcohol, and then separating the alcohol from the oil by distillation. When water is distilled off this bark it comes over milky, from the accompanying oil, which it retains with great obstinacy; very little separating till the mixture has stood a considerable time.

MEDICAL PROPERTIES AND USES.—Cinnamon bark is one of the most grateful aromatic stomachics that we possess, and is reckoned to be stimulant, stomachic, astringent, and tonic. It is principally employed, however, as an adjunct to other remedies, to prevent their griping effect, or to cover their nauseous taste. The oil being a powerful stimulant is sometimes employed to allay spasmodic affections of the stomach and bowels, hiccup, and nausea. It is also applied sometimes to relieve the pain of decayed teeth.

OFF. PREP.—Aqua Cinnamomi. L.E.D.

Spiritus Cinnamomi. L.E.D.

Tinctura Cinnamomi. comp. L.E.D.

Pulvis Cinnamomi, comp. L.E.

LAURUS CAMPHORA.—*Japanese Camphor-tree.*

SPEC. CHAR. *Leaves* elliptical, pointed; 3-ribbed far above the elongated base. *Clusters* axillary, somewhat compound, shorter than the leaves.

Syn.—Camphora officinarum. *Bauh. Pin.* 500; *Blackw. t.* 347.

Arbor camphorifera japonica. *Commel. Hort. Amst. c.* 1. 185. *t.* 95.

Laurus Camphora. *Lin. Sp. Pl.* 521; *Willd. ii. p.* 478; *Jacq. Coll. v.* 4. 221. *t.* 3. *f.* 2; *Kämpf. Amdn.* 770. *t.* 771; *Woodv. t.* 155.

THE Japanese camphor is obtained by distillation from this tree, but the greater part of what is brought to Europe from Sumatra and Borneo is now fully ascertained to be the produce of the

Dryobalanops Camphora, a tree belonging to a distinct genus from the laurel. The camphor laurel is a native of Japan, and is sometimes to be seen flowering in our stoves. It is a large tree, with ascending branches. The leaves are ovate-lanceolate, entire, smooth, ribbed, of a pale yellowish green colour on the upper surface, on the under glaucous, and stand on long foot-stalks. The flowers are small, white, set on long, naked, lateral peduncles. The corolla is composed of six ovate, concave unequal petals, enclosing a tuberculated bristled nectary, which surround the germen. The filaments are shorter than the corolla with round anthers. The germen is roundish with a simple style. The fruit is a small ovate berry, of a dusky brown or reddish colour resembling that of the cinnamon.

For an account of the *Chemical Properties* and *Uses* of Camphor, see the article DRYOBALANOPS.



Centaurea — Benedicta.

CENTAUREA BENEDICTA.

Blessed Thistle.

Class XIX. SYNGENESIA.—**Order III.** POL. FRUS-
TRANEÆ.

Nat. Ord. COMPOSITÆ, *capitate*, **Lin.** CYNAROCE-
PHALÆ, **Juss.** CYNARACEÆ, **Burm.**

GEN. CHAR. *Receptacle* bristly. *Seed-down* simple,
or feathery, rarely wanting. *Florets* of the radius
funnel-shaped, dilated, irregular.

SPEC. CHAR. *Fruit* doubly spinous, woolly, invo-
lucred. *Leaves* semidecurrent, toothed, spinous.

Syn.—*Cnicus sylvestris hirsutior* sive *Carduus benedictus*, **Bauh. Pin.** 378.

Carduus benedictus, **Camerl. Epit.** 582; **Dod. Pempt.** 725; **Bauh. Hist.** 3.
75, t. 2: **Rat. Hist.** 303; **Ger. Em.** 1171. 2. f.; **Park.** 530.

Centaurea benedicta, **Sp. Pl. Willd.** iii. 2315; **Woodw.** 119. t. 42, **Zorn. Icon.**
122.

FOREIGN.—*Chardon benêt*, **Fr.**; *Curda adato*, **It.**; *Curda benito*, **Sp.**; *Kardo benedictenkraut*, *Benedicten-Flockenkraut*, **Ger.**

BLESSED THISTLE is an annual plant, growing spontaneously in the south of France, Spain, Barbary, and the Levant, flowering plentifully in June, and partially until September. It was formerly much cultivated in our gardens, where it thrives as well as in its native soil. Our figure was made from a specimen obtained in the Botanic Garden, Chelsea.

The root is tapering, whitish, branched, and furnished with many slender fibres. The stems are several, a foot and a half high, trailing, roundish, channelled, reddish, woolly, and branched towards the top. The lower leaves stand upon footstalks, but the upper are sessile, alternate, and somewhat decurrent; the whole are oblong, rough, with short hairs, aculeated, sinuated, or almost runcinate, and armed with many sharp spines; of a green colour, with a strong, whitish midrib, paler underneath and reticulated. The flowers are large, bright yellow, solitary at the ends of the branches, inclosed by an in-

volucrum of ten leaves ; of these the five external ones are largest. The calyx is oval, imbricated, smooth, woolly, each scale being terminated by pinnate spines, connected with the involucrum by fine cobweb-like threads. The florets of the ray are small and sterile ; those of the disc are hermaphrodite, tubular, unequally divided, and toothed at their upper extremities. The filaments are five, capillary, downy, and inserted in the base of the tube of each floret ; the anthers are vertical, linear, oblong, united into a cylinder, and longer than the corolla ; the style is filiform, and the stigma cloven. The fruits (achenopsides) have a paleaceous receptacle, are oblong, brown, striated, and crowned with a hairy seed down or pappus.—Fig. (a) represents a flower detached from the involucrum ; (b) the same with the scales of the involucrum removed ; (c) a floret, &c. magnified ; (d) the stamens and anthers ; (e) the pistil.

QUALITIES.—This plant has little or no smell, but the taste is intensely bitter. “ Its virtues are extracted both by water and alcohol. The watery infusion has a pale, greenish-yellow colour, which is changed to deep olive, by sulphate of iron, and an orange-brown by the pure alkalis, although the carbonates do not affect it. *Nitrate of silver* and *superacetate of lead* produce copious precipitates, and are, therefore, incompatible with this infusion.”

MEDICAL PROPERTIES AND USES.—This plant was formerly in such high repute, that it obtained the name of the “ *blessed thistle*,” and was given for the plague, worms and numerous other diseases. If we are to believe Simon Pauli, it has no equal in healing obstinate ulcers, and even cancers ; and Arnoldus de Villa-nova lauds it in the same extravagant manner. Notwithstanding that it is now but little employed, it is a useful medicine ; the strong decoction, or infusion, being capable, like the chamomile, of inducing vomiting. The infusion, less strong, taken while warm, produces a copious determination to the skin, while six drachms of the leaves, to a pint of cold water, forms an elegant bitter infusion, which is very efficacious in loss of appetite and dyspepsia. The dose in powder is from ten to forty grains ; of the infusion, a wine glassful every four hours.



Pistacia terebinthus

PISTACIA TEREBINTHUS.

Chian Turpentine Tree.

Class XX. DIOECIA.—Order V. PENTANDRIA.

Nat. Ord. AMENTACEÆ, Lin. TEREBINACEÆ, Juss. ANACARDIÆ, Brown, *De Cand.* &c. CASSUVIACEÆ PISTACIDÆ, Burn.

GEN. CHAR. Male, *Calyx* 5-cleft. *Corolla* 0. Female, *Calyx* 3-cleft. *Corolla* 0. *Styles* 3. *Drupe* 1-seeded.

SPEC. CHAR. *Leaves* pinnate, with a terminal one; leaflets about seven, ovate-lanceolate, rounded at the base. *Flowers* paniced. Segments of the *calyx* awl-shaped, longer than the stamens.

Syn.—*Terebinthus*. Camer. *Æpit.* 51; Ger. *Em.* 1433; Matth. *Valgr.* 1. 101; Raii *Hist.* 1577; Clus. *Hist.* 1. 12; Bauh. *Hist.* 1. 279.

Terebinthus vulgaris. Bau. *Pin.* 400; Tourn. *Inst.* 579; Duham. *Arb.* v. 2. 306. t. 87.

Pistacia Terebinthus. Lin. *Sp. Pl.* 1455; Wild. 4. 752; Villars *Dauph.* 2. 547; Forsk. *Ægypt.* cent. 8. p. 209; Woodv. t. 153; Scop. *Carn.* 2 n. 1218; Blackw. t. 478; Stokes 4. 531.

FOREIGN.—*Térébinthe*; *Pistachier sauvage*, Fr.; *Terebinto*, Ital.; *Cornicabra*, Sp.; *Terpantinbaum*, Germ.

THIS tree affords the Chian, or Cyprus Turpentine. It is a native of the south of Europe and the north of Africa. It is cultivated in the islands of Scio, (the Chios of the ancients,) and Cyprus, and has been long known in this country as an ornamental plant. There is a fine female tree in Chelsea Garden, near the gate, from which the accompanying figure was designed.

The *Pistacia Terebinthus* is a tree of low stature, seldom attaining the height of thirty or thirty-five feet. The trunk and branches are invested with a dark grey or rugged blackish bark, and bent in all directions. The leaves are pinnate, and consist of three pair of ovate-oblong, entire, smooth leaflets, with an odd one, all of a dark green colour, and somewhat curved backward. They are, in our climate, deciduous, and according to Sir James Ed. Smith appear by Dr. Sibthorpe's drawings, to be so in Greece. The young leaves have a beautiful reddish hue, and are thin

smooth, and shining. The flowers, which appear in May and June, are on different trees, in large, very compound panicles. In the stamjaneous ones the calyx consists of one leaf, and is divided into five deep equal segments. There is no corolla. The filaments are four or five in number, capillary, very short, and supporting large, brown, erect, oblong quadrangular anthers, of two cells bursting lengthwise. The pistilline flowers are placed on a common peduncle in alternate order, consisting of a calyx in three small squamous segments, and a roundish somewhat triangular germen, supporting three erect styles, with obovate, reflexed, clubbed stigmas. The fruit is a drupe, scarcely bigger than a large pea, ovate, smooth, a little compressed, and of a reddish colour. Galls of the same shape are found on the leaves, and very large pod-like ones, are often produced from the young branches, as the figures of the older botanists represent.

Cyprus or Chian turpentine, which is furnished by this tree, is procured by wounding the bark of the trunk in several places, during the month of July, leaving a space of about three inches between the wounds; from these the turpentine exudes and is received on stones, upon which it becomes condensed by the coldness of the night, so as to admit of being scraped off before sunrise. To free it from extraneous substances, it is again liquefied by the sun's heat, and pressed through a strainer, when it is fit for use. The quantity produced is so very inconsiderable, that large trees, sixty years old, are said to yield on an average only two pounds nine ounces and six drachms a piece; but in the eastern part of Cyprus and Chio, the trees afford somewhat more, though still so little as to render its price high, on which account it is much adulterated with the other turpentines.

QUALITIES.—The best Chio turpentine is generally about the consistence of thick honey; is very tenacious, clear, and almost transparent; of a white colour inclining to yellow, and of a fragrant smell; moderately warm to the taste, but free from acrimony and bitterness.

MEDICAL PROPERTIES.—The medical properties of the turpentines has been fully detailed under the article PINUS, in this work, and the Chio turpentine, although more pure than the exudations from the coniferæ, possesses similar properties.



Pistacia Lentiscus

PISTACIA LENTISCUS.

Mastic Tree.

SPEC. CHAR. *Leaves* abruptly pinnate; *leaflets* ovate-lanceolate. *Flowers* racemose. Segments of the *calyx* ovate, shorter than the stamens.

Syn.—*Lentiscus*, Ger. Em. 1432, Park. 1524, Bau. Hist. 1597, Camer. Ept. 50. Bauh. Hist. 1. pars 1 p. 285, Lob. Ic. 2. 96, Clus. Hist. 84. t. 8, Dod. Pempt. 371, Math. Vulgr. 1. 99; Backb. Herb 1 t. 195; Tourn. Voy. 1. p. 375.

Pistacia Lentiscus, Lin. Sp. Pl. 1455, Willd. v. 4. 753; Hort. Kew. ed. 2d. v. 5. p. 381; Woodw. t. 412, Bot. Mag v 45. t. 1967.

FOREIGN.—*Lentiscus*, Fr.; *Lentisco*, It. Sp. and Port., *Der Mastirchaum*, *Das ewige Holz*, Ger.; *Lakas, Tusk.*, *Roomie mustakie*. Hind , *Arah*, Arab.

THE Mastic-tree is a native of the south of Europe and the Levant, and appears by Evelyn's *Kalendarium Hortense* to have been cultivated in Britain so early as 1664. It is less hardy than the Chian turpentine-tree, requiring the shelter of a greenhouse, hence it never attains here any degree of perfection. In Italy it is very common, flowering in April, as well as in the island of Scio, where its resin, called *mastic*, is chiefly obtained, and where different varieties are consequently cultivated with care. It differs from every other known *Pistacia* in having no odd leaflet, as well as in its simply racemose inflorescence.

This tree, which seldom exceeds twelve feet in height, and eight or ten inches in diameter, is covered with a smooth brown bark, and towards the top sends off numerous branches. The leaves are abruptly pinnate, consisting of five or six opposite pairs of narrow ovate leaflets, of a dark green colour on the upper, and pale on the under side. They are smooth, pointed at each end, and tipped at the point with a minute curved spine; sessile or closely attached to the common footstalk, which is winged or furnished with a narrow foliaceous expansion on each side, running from one pair of leaflets to the other. The flowers,

which appear in simple axillary racemes in April and May, resemble those of the former species. In the *male* flowers, the calyx is divided into five minute ovate segments; the filaments are four or five in number, very short, and supporting large, brown, erect, quadrangular anthers. The *female*, like those of the male, have no corolla, and are placed upon a common peduncle in alternate order; the calyx consists of three small squamous segments; the germen is egg-shaped, larger than the calyx, and supports two or three styles, with reflexed clubbed stigmas. The fruit is an obovate, smooth reddish drupe, containing a smooth nut. Fig. (a) represents a female flower magnified; (b) male flowers; (c) back view of a female flower, shewing the five-cleft calyx.

In the island of Chios, the officinal mastic is obtained most abundantly, according to Tournesort,* by making transverse incisions in the bark of the tree about the beginning of August, from which the resin exudes in drops, and hardening on the trees, or running down and concreting on the ground, is thence collected for use. The time chosen for making these incisions is the first of August, when the weather is very dry; during the following day the mastic begins to appear in drops, which continue to exude till the latter end of September. According to Olivier (Travels in the Ottoman Empire) mastic is gathered in twenty-one villages of the island of Scio; and the incisions, he says, are made from the 15th to the 20th of July, according to the Greek calendar. Cloths are frequently placed under the tree, so that the mastic which trickles from it may not be contaminated with earth and other impurities. By the regulations made in the island, the first gathering cannot take place before the 27th of August. It lasts eight successive days, after which fresh incisions are made in the trees till the 25th of September, and then the second gathering is made, which likewise lasts eight days. After this time the trees are cut no more, but the mastic which continues to run is collected till the 19th of November, on the Monday and Tuesday of every week. It is afterwards forbidden to gather this production, which in the twenty-one

* *Voyage du Levant*, v. i. p. 44.

villages of Scio, amounts on an average to 50,000 *okes*, and even more: twenty-one thousand belong to the *aga*, who farms this commodity, and are delivered by the cultivators in payment of their personal impost. They are paid for the surplus at the rate of 50 *paras* per *oke*, (nearly 16 sous the pound,) and they are prohibited, under very severe penalties, from selling or disposing of it to any other than the *aga* who farms it. That of the best, and finest quality is sent to Constantinople, for the palace of the Grand Signior; that of the second quality is intended for Cairo, and passes into the harems of the Mamelukes. The merchants generally obtain a mixture of the second and third quality. The lentisc or mastic-tree is raised in various parts of Europe, particularly in Italy and Portugal, but no resin is said to issue from it in these climates.

QUALITIES AND CHEMICAL PROPERTIES.—Mastic, which is brought to us in yellowish semi-transparent brittle grains or tears, is nearly inodorous, except when rubbed or heated, when it exhales an agreeable odour. It is almost tasteless; and when chewed it is soft and tough, like wax, but soon becomes white, opaque, and brittle; hence it is frequently employed by surgeons for stopping carious teeth. In Turkey great quantities of it are chewed for sweetening the breath and strengthening the gums; and it is to this use of the resin as a masticatory, that it is supposed to owe its name. Its specific gravity is 1,074. By digestion with alcohol it is separated into two portions; the one soluble in this fluid, and the other insoluble; the former composes about three-fourths of the whole, and is pure resin; the latter, in most of its properties, resembles caoutchouc. The nature of this insoluble portion was first discovered by Kind, an apothecary at Berlin, whose observations have since been confirmed by Mr. Matthews. Mr. Brande, however, has observed that when this insoluble substance is dried, it becomes brittle, in which respect it differs from caoutchouc. From these experiments, and those of Dr. Wollaston, there can be little doubt that it is a peculiar vegetable principle. Mastic is perfectly soluble in sulphuric ether, from which it is precipitated by alcohol in the form of a white curd. When distilled, either with water or alcohol, accord-

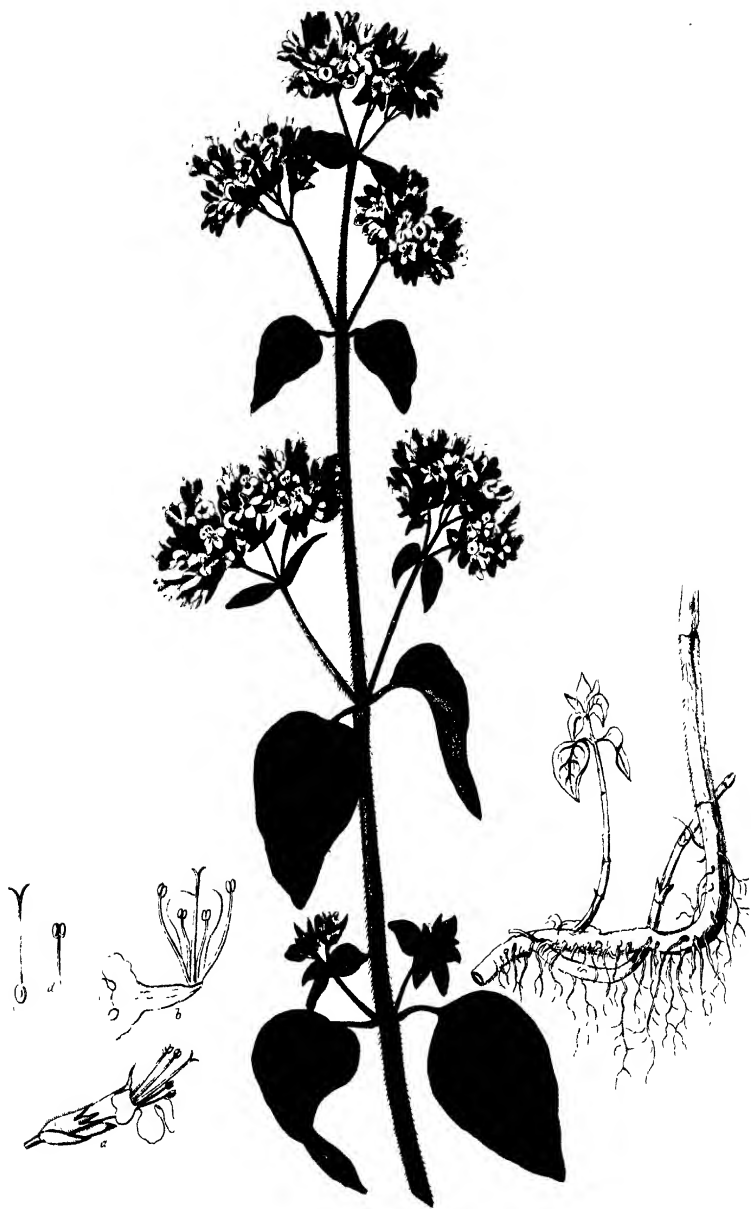
ing to Dr. Thomson, no volatile oil is obtained from this substance. It should be chosen clear, of a pale yellow colour, and of an agreeable odour when heated or rubbed.

MEDICAL PROPERTIES AND USES.—Although the principal consumption of mastic is among varnish-makers, it has been long introduced into medicine under the character of an astringent and diuretic in obstinate coughs, dysentery, fluor albus, gleet, hæmoptysis, dyspeptic complaints, and internal ulcerations; but it probably possesses no powers of any kind but what may be ascribed to its moderately stimulant effect upon the organs of secretion. By means of mucilage and syrup, mastic dissolved in alcohol, is rendered miscible with water, and supposed to possess the virtues of turpentine in an inferior degree. The Arabians regard it as astringent and tonic, and Avicenna speaks of its discutient qualities; he moreover says, “Tussi et sanguine rejectione prodest. Stomachum roborat et jecur.”* In pharmacy it is sometimes employed as an adjunct to pills, to render them less immediately soluble in the stomach, and consequently more progressive in their operation. The wood (*Len-tisci lignum*) is received into the materia medica of some of the foreign pharmacopœias, and highly extolled in gouty, hæmorrhagic, and dyspeptic affections.† In the arts mastic is much used, in combination with lac, elemi, and other resins, in the composition of varnishes; and the jewellers mix it with turpentine, and ivory black, and place it under the diamond to add to its lustre. Virey, in his “Histoire Naturelle des Médicaments,” informs us, that from the kernels of the mastic-tree an oil may be obtained which is fit for table; and according to Desfontaines and Duhamel the *Pistacia atlantica*, and *P. chia* yield resins which resemble mastic.

DOSE.—The dose may be from gr. x. to ʒss. twice a day.

* See *Canon. Med.* lib. ii. tract. ii. p. 189.

† See *Ephem. Nat. Cur.* dec. 3. a. 9. 10. obs. 135.



Origanum vulgare

ORIGANUM VULGARE.

Common Marjoram.

Class XIX. DIDYNAMIA. — Order I. GYMNOSPERMIA.

Nat. Ord. VERTICILLATÆ, Lin. LABIATÆ, Juss. De Cand. &c. MENTHACÆ, Burn.

GEN. CHAR. *Calyx* without ribs. *Involucrum* of numerous dilated, flat leaves, one to each flower, collected into a spurious *catkin*.

SPEC. CHAR. Heads of flowers roundish, paniced, crowded, erect. *Involucral leaves* ovate, smooth. *Calyx* with five acute unequal teeth; throat hairy.

Syn.—*Origanum vulgare spontaneum, Raii Syn.* 236.

Origanum anglicum, Ger. Em. 666. f.

Origanum, n. 233; *Hall. Hist. v. 1.* 102; *Riv. Monop. Irr. t.* 60. f. 1.

Origanum sylvestre, seu vulgare. Fuchs. Hist. 552. f. 1c. 315. f.

Majorana ovalifolia. Stokes Bot. Mat. Med. v. 3. p. 350.

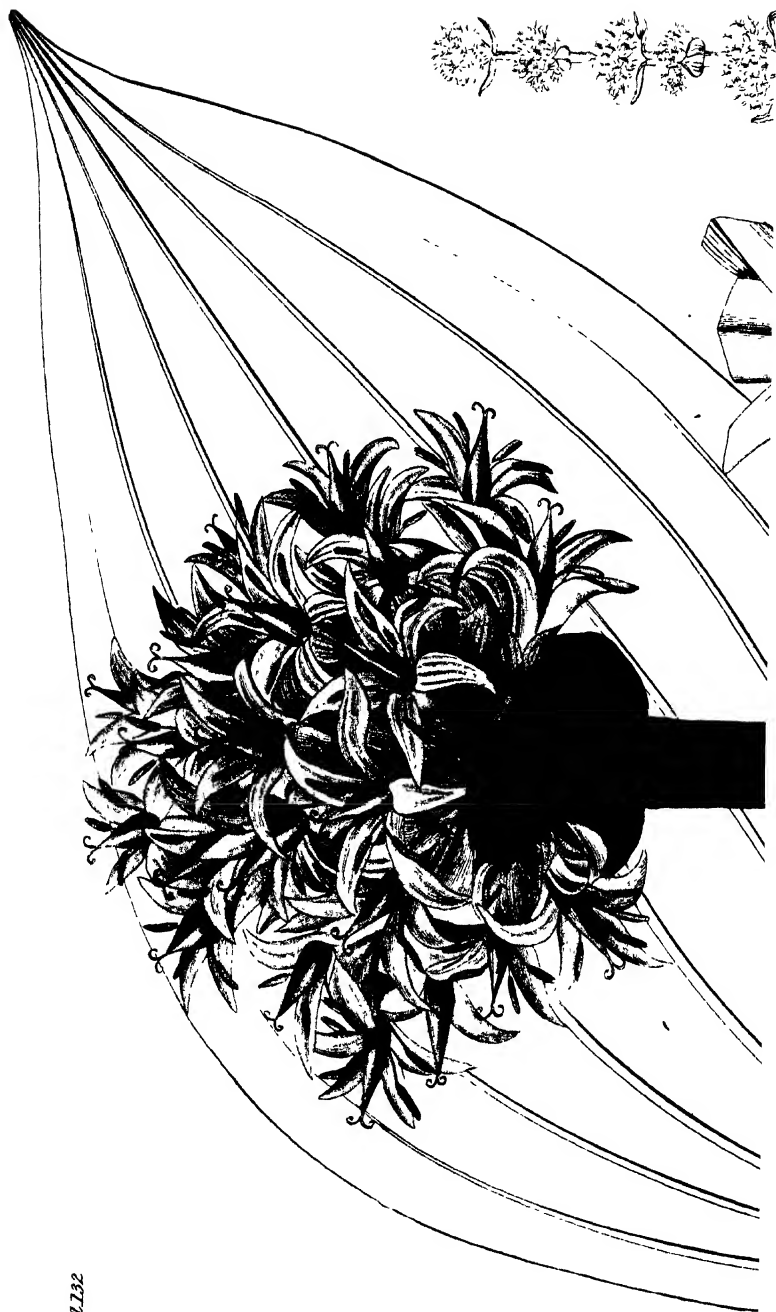
Origanum vulgare. Lin. Sp. Pl. 824; *Willd. v. 3.* 135; *Fl. Brit.* 369; *Eng. Bot. v. 16. t.* 1143; *Curt. Lond. fasc. 5. t.* 39; *Hook. Scot.* 184; *Matth. Valgr. v. 2.* 62. f; *Camer. Epit.* 469. f; *Woodv. t.* 164. *Stokes, 3.* 344.

FOREIGN.—*Origan, Fr.; Origano, It.; Oregano; Erba d' aociughe, Sp.; Ourégano, Port.; Dosten; Gemeine Doste; Wilder Majoran, Ger.; Duschisa; Dork. Russ.*

THE Common Marjoram is a perennial plant, a native of Europe, growing on dry gravelly hills. With us it chiefly occurs in thickets, on chalk or limestone, flowering in July and August.

From a brownish, creeping, fibrous root-stake arise several erect, leafy, angular, purplish stems, about a foot high, clothed with short recurved hairs, and branched and paniced at the summit. The leaves are deflexed, ovate, pointed, dark green, entire, or slightly serrated, minutely fringed, petioled, and grow in pairs at the joints. The flowers are in dense, convex, terminal panicles, of a light purple or rose colour, and furnished with numerous ovate, sessile bractes, one under each flower, rather longer than the calyx. The calyx is tubular, five toothed; like the leaves covered with resinous dots, and fringed at the mouth

mon marjoram enters as an ingredient into the composition of some cephalic snuffs. Murray, in his Apparatus Medicamentum, speaking of this plant, says, "Tumores mammarum dolentes, scirrhusos, herba recens, viridis, per tempus applicata, feliciter dissipavit."





GENTIANA LUTEA.

Yellow Gentian.

Class V. PENTANDRIA.—Order II. DIGYNIA.

*Nat. Ord. ROTACEÆ, Lin. GENTIANÆ, Juss. GENTI-
ANACEÆ, GENTIANIDÆ, Burn.*

GEN. CHAR. *Corolla* tubular at the base, destitute of nectariferous pores. *Capsule* superior, 2-valved, 1-celled. *Stigmas* 2.

SPEC. CHAR. *Corolla* 5-cleft, wheel-shaped. *Flowers* whorled, yellow. *Calyx* spathaceous.

Syn. *Aorepius* Renealm. *spec.* 64. t. 63.

Ferrarij. Disc. et Græcor.

Gentiana. Camer. Epit. 415 ; *Fuchs. Hist.* 200 ; *Dod. Pempt.* 324 ; *Clus. Hist.* 1. 311.

Gentiana major. Ger. Em. 432 ; *Rait Hist.* 716.

Gentiana major lutea. Bauh. Pin. 187 ; *Park.* 350 ; *Tourn. Inst.* 80.

Gentiana vulgaris major, Ellebori albi folio. Bauh. Hist. v. 3. p. 520.

Gentiana caule folioso, foliis ovatis nervosis, floribus verticillatis, rotatis. n. 637. *Pall. Helv.*

Gentiana lutea. Lin. Sp. Pl. 329 ; *Willd. v. 1.* 1331 ; *Scop. Carn. n.* 298 ; *Allion. Pedem. n.* 365 ; *Villars Dauph. 2.* 511 ; *Mill. t.* 139. f. 2 ; *Plenck. Ic.* t. 156 ; *Woodv. 3.* 166 ; 2. 44.

FOREIGN,—*Gentiane jaunee, ou grande gentiane, Fr.* ; *Gentiana gialla, It.* ; *Jenciana amarilla* ; *Gengiba, Sp.* ; *Genciana amarella, Port.* ; *Der gelbe Enzian* ; *Bergenzian* ; *Bitterwursel, Ger.* ; *Geele Gentean, Dut.* ; *Sodrod* ; *Entzian-rod, Dan.* ; *Baggfota, Swed.*

Of this fine genus more than sixty species have been described by botanists, and six of these, viz. *Gentiana Pneumonanthe, acaulis, verna, Amarella, campestris, and nivalis*, are natives of Britain. They are elegant herbaceous plants, mostly inhabiting alpine regions of the northern hemisphere, and extremely various in size, with flowers generally of a vivid blue. Most of them are perennial; some few are annual; but they are all intensely bitter, especially the roots of the larger perennial kinds. Few of the species are cultivated in our gardens, except the *Gentiana acaulis*, or Dwarf Gentian, distinguished by its humble growth, its large solitary, bell-shaped, exquisitely beautiful, azure flowers,

and the *G. lutea*, or Yellow Gentian, neither of which are observed to thrive well in the vicinity of large towns. The latter, which is the officinal species, grows abundantly on the Alps of Switzerland and Austria, the Apennines, the Pyrenees, in the mountainous forests of many parts of Germany, and in North America. It thrives well in this country, in a deep, rich, loamy soil, flowering about the end of June or beginning of July, and few plants are more stately and ornamental. The figure, which represents this interesting plant of the natural size, was made from a fine specimen obligingly communicated to us by the Countess of Bridgewater.

The root is perennial, long, roundish, with numerous thick contorted branches, brown externally, and yellowish within. The stem is simple, erect, hollow, roundish, and somewhat annulated and square at the base near the root, cylindrical and smooth towards the top, and rises three or four feet in height. The lower leaves are petiolate, large, spear-shaped, entire, five or six-ribbed and plaited ; those of the stem are concave, ovate, smooth, sessile, almost embracing the stem, and of a yellowish green colour. The flowers are large and handsome, yellow, produced in whorls at the upper joints, and stand upon long peduncles. The calyx, which is a membranous, deciduous spathe, bursts on the side when the flower opens ; the corolla is rotate, and divided into five or more long, narrow, spreading, elliptical segments. The filaments vary from five to eight, according to the number of segments, and are alternate therewith ; they are shorter than the corolla, and furnished with long erect anthers. The germen is conical, crowned with two sessile reflected stigmas ; and becomes a conical capsule, divided into two valves, and contains numerous small, compressed, winged seeds. Fig. (a) represents a ripe capsule ; (b) a valve of the capsule, containing the seeds ; (c) a seed ; (d) an outline view of the plant in miniature, to show its general habit.

The scientific name *Gentiana*, was conferred on this genus in commemoration of Gentius, a king of Illyria, who, according to Pliny, first discovered, or at least experienced the virtues of the principal species, the *Gentiana lutea* of Linneus, in the cure of

the plague, which infected his army. The vulgar name *Fell-wort* or *Gall-wort*, is strictly applicable to the whole genus, on account of the extreme bitterness of the plants which compose it.

CULTURE.—Yellow Gentian delights in a deep loamy soil and a shady situation, where it will thrive much better than in a light soil, or an open exposed site. It is propagated by seed, which should be sown in pots soon after it is ripe, for if it is kept till the spring it will not germinate; these pots should be placed in a shady situation, and kept clean from weeds. In the spring the plants will appear, when they must be duly watered in dry weather, and kept free from weeds till the following autumn; they should then be carefully shaken out of the pots, so as not to break or injure the roots; and a shady border of loamy earth should be well dug and prepared to receive them, into which the plants should be put, at about six inches distance each way, observing to let the tops of the roots be a little below the surface of the ground, then press the earth close to the roots; after this they will require no farther care, but to keep them constantly clean from weeds; and if the following spring should prove dry, they should be regularly watered, which will greatly forward their growth. In this border the plants may stand two years, by which time they will be fit to transplant where they are designed to remain; therefore in autumn, so soon as the leaves decay, they may be removed; but as the roots of these plants run deep into the ground, like carrots, there must be great care taken in digging them up not to cut or break their roots, for that will much weaken, if it does not kill them. After the plants are well fixed in their places, they require no particular care, but to dig the ground about them early in the spring before they begin to shoot, and in the summer to keep them clear from weeds. The roots of these plants will continue for many years, but the stalks decay every autumn; the same roots do not flower two years together, nor seldom oftener than every third year; but when they flower strong, says Professor Martyn, to whose edition of Miller's Dictionary, we owe the preceding remarks, they make a fine appearance; and as they delight in moist shady ground, where but few ornamental plants will thrive, they should not be

wanting in good gardens. The dried roots are imported into this country chiefly from Germany; but we know no reason why the plant should not be cultivated in our physic gardens.

QUALITIES AND CHEMICAL PROPERTIES.—Gentian roots are long, and contain so large a proportion of water, that when dried, they are much wrinkled. Externally they are brown, internally spongy, and of a deep yellow colour. The best roots are of a middling size, of a lively yellow colour, tough, and almost free from fibres. The older and larger roots are more porous; the younger and tender more compact. Neuman obtained from 3xvj. of the root, by means of rectified spirit. 3viiss. of resinous extract: and from water 3ix. of a gummy one. Sometimes the *Thora valdensis* of Ray, or the *Aconitum pardalianches* of Bauhin, is sold for the Gentian. It is known from the true Gentian by its paler colour externally, having longitudinal wrinkles; its texture is closer than that of Gentian, whitish within, and not bitter; but when chewed, only mucilaginous. It is the *Ranunculus Thora*, Lin. Sp. Pl. 775. Gentian yields its virtues to ether, alcohol, and water. A singular circumstance is connected with the analysis of this root: M. Henry and M. Caventou being employed at the same time in this pursuit, without being aware of each other's proceedings, both discovered the substance termed '*gentianine*', the principle on which the bitter and medicinal properties of the Gentian seem to depend; and so little did they differ in the results of their investigations, that they resolved to promulgate their labours together.*

Preparation of Gentianine.—The powder of gentian is to be exposed to cold ether, which at the end of forty-eight hours furnishes a greenish tincture; this being filtered, poured into an open vessel, and exposed to heat, if the liquor be sufficiently concentrated upon cooling, settles into a yellowish crystalline mass, possessing a decided smell and taste of gentian. This mass is then to be treated with alcohol until it ceases to yield a citron colour. The washings are to be mixed, and exposed to a strong heat, and the yellow crystalline substance begins to reappear, assuming at the close of the evaporating process a solid form, and

* A remarkable fact, says M. Magendie on two accounts; first, as proving the degree of perfection to which the modes of vegetable analysis have of late years reached; and secondly, as illustrating the change that the progress of science has wrought among its votaries. Had such a contingency happened 100 years back, the consequence would have been an obstinate dispute between the parties. In the present day it has been the cause of pleasure to them, each finding the importance of his discovery confirmed by that of the other.

being extremely bitter. Taken up again by weak alcohol, it is partially dissolved, a certain portion of oily matter remaining separate. This last spirituous solution, besides the bitter principle of the gentian, contains an acid substance, and the odorous principle also.

Upon evaporating this liquid to dryness, washing the residue in water, adding a little calcined and well washed magnesia, boiling and evaporating in a water-bath, the greater part of the odorous matter of the gentian is driven off; the acidity is removed by the magnesia, and the bitter principle remains, partly free, and partly in a state of combination with magnesia, to which it imparts a beautiful yellow colour. Then upon boiling this magnesia with ether, the greater part of the bitter principle is obtained pure, and is insulated by evaporation. If it be wished to separate the bitter principle which remains in the magnesia, in a fixed state, and which could not be taken up by the ether, we may treat it with oxalic acid, in a quantity sufficient to produce slight acidity. This acid unites with the magnesia, and sets the bitter principle at liberty, which may be obtained in the manner already pointed out.

Properties of Gentianine.—This substance is yellow, and inodorous, possessing very strongly the aromatic bitter taste of the gentian, which is much increased by solution in an acid. It is highly soluble in ether and in alcohol, and separates by spontaneous evaporation in the form of very small yellow crystalline needles. It is much less soluble in cold water, which nevertheless it renders exceedingly bitter: in boiling water it is more readily dissolved. Diluted alkalis deepen its colour very much and dissolve rather more of it than water will alone.

Acids diminish its yellow colour in a very remarkable manner. With sulphuric and phosphoric acids the solution is almost colourless; but yellowish with the weaker acids, such as the acetic. Concentrated sulphuric acid carbonizes it and destroys its bitterness.

Exposed in a glass tube to the heat of boiling mercury, gentianine sublimes in the form of small yellow crystalline needles, and is partially decomposed. It has no sensible effect on turnsol, either when blue, or reddened by acids—being apparently neutral.

Action of Gentianine on the Animal and Human System.—M. Magendie has ascertained by experiment that this substance is not possessed of any poisonous qualities; several grains injected into the veins produced no effect. He himself swallowed two grains dissolved in alcohol, and was merely sensible of the extreme bitter taste, and a slight sensation of heat in the stomach.

Medicinal Employment.—The tincture seems to be the preferable form for administration; and it may be made in the following manner:

Take of	Alcohol at 24°	. . .	1 ounce.
	Gentianine	. . .	5 grains.

Mix.

This may be substituted for the tincture of gentian, and employed in the same circumstances.

<i>Syrup of Gentianine.</i> —Take of	Simple syrup	. .	1 pound.
	Gentianine	. .	16 grains.

Make a syrup.

This is one of the best bitters that can be employed in scrofulous affections.

MEDICAL PROPERTIES AND USES.—The root of this plant has been used from time immemorial as a valuable tonic, and occupied the first place as a febrifuge before the discovery of the Cinchonas. In large doses it is somewhat aperient; but in smaller ones is found highly beneficial in dyspepsia, gout, hysteria, and jaundice; in chlorosis and torpor of the intestinal canal; indeed in all those cases of debility in which it is generally considered proper to administer tonics. The infusion, as ordered by the London College, is the most elegant and proper mode of administering it, and forms an excellent medium for the exhibition of chalybeates, mineral acids, and neutral salts, with which it is often necessary to combine it. The following is the form:—

Take of, Gentian root, sliced, orange peel bruised, coriander seeds bruised, of each *a drachm.*

Fresh lemon peel *two drachms*, boiling water twelve *fluid ounces.*

Macerate for an hour in a vessel lightly covered, and strain.

“It is given,” remarks Dr. T. Thompson, “in dyspepsia and chlorosis, united with chalybeates, or with alkalis;” in gout and diarrhœa, with absorbents and aromatics; in jaundice, with rhubarb and saline purgatives; and in dropsies, with squills and neutral salts. The dose is a small wine-glass-full three or four times a-day.

A strong simple infusion is known to possess antiseptic properties, and has therefore been applied externally to putrid ulcers. Before hops had established their reputation, this, with many other bitter herbs, was occasionally used in brewing.

Though the root of the *Gentiana lutea* is one of the most valuable bitters now employed in medicine, the roots of several other species are supposed to be equally efficacious. The dwarf autumnal gentian, *Gentiana Amarella*, (*Eng. Bot. v 4. t. 236*,) which obtains a place in some of the foreign dispensatories, by the name of *Gentianella*, is said to possess sensible qualities and medicinal properties similar to those of the larger kinds. The purple gentian, *Gentiana purpurea*, (*Andr. Bot. Repos. t. 117*,) which is a native of the Alps, and was introduced into this

country by Saussure in 1768, is a powerful bitter, greatly resembling in appearance and taste the officinal gentian, but in no degree superior, though used by some practitioners of Edinburgh for nearly half a century. Another species of this genus, the Chirayit Gentian or Wormseed plant, the *Gentiana Chirayita*, of Roxburgh, has lately been brought into notice in England by Mr. Baker. It is an herbaceous plant, and is said by Dr. Fleming to be indigenous to the mountains to the westward of the Ganges, "having leaves stem clasping lanceolate, 3-5 nerved; corolla rotate, four-cleft, smooth; stamens four; capsule ovate, bifurcate, as long as the calyx." (Roxb. MSS.) It is said by Dr. Ainslie to be much used in decoction and infusion by the European practitioners of Bengal, and is found efficacious in combination with the *caranja* nut, (*Gaillardina Bonducella*, Lin.) in curing intermittent fevers. "What appears in the bazars of Lower India, under the Tamool name *chayraet toochie*,) are small stalks of a light grey colour, and very bitter, but pleasant taste; the natives consider them as tonic, stomachic, and febrifuge, and prescribe a decoction or infusion of them, in the quantity of a small teacup-full, twice daily."

From inquiries which we made of a Hindoo, we ascertained that the infusion of the Chirayit Gentian, made very strong, is taken in large doses as a tonic, and often induces vomiting from its intense bitterness. It likewise occasionally acts with freedom on the bowels, producing copious bilious evacuations, on account of which it is highly esteemed in liver complaints. Given in the form of infusion, made with two drachms of the herb in half a pint of water, it seems simply to possess properties allied to our officinal plant.

MISTURA GENTIANÆ CUM MAGNESIA.

R Magnesiæ carbonatis ʒiiss.
 Infusi Gentianæ compositi ʒvj.
 — Caryophyllorum ʒij.

Fiat mistura, de quo sumat cochlearia tria majora bis die.—In dyspepsia, attended with acidity, this mixture generally proves very beneficial.

MISTURA GENTIANÆ SULPHURICA.

- R Infusi Gentianæ compos. ʒv.
 Tincturæ Gentianæ comp. ʒj.
 Acidi sulphurici diluti ʒj.

Fiat mistura, cujus cochlearia tria majora ter die sumantur. This mode of administering gentian is recommended by Mr. Brande, where dyspepsia is attended with nausea and aversion to food.

INFUSUM GENTIANÆ CUM RHEO.

- Rj. Gentianæ rad. concisæ. ʒj.
 Rhei rad. concisæ. ʒij.
 Aquæ ferventis. ʒxii.
 Maceræ per horam, cola, et adde
 Ammonia subcarbonatis. ʒij. Dosis, ʒij.

In some forms of dyspepsia, chronic rheumatism, and irregular or chronic gout.

HAUSTUS GENTIANÆ CUM SENNA.

- Rj. Infusi gentianæ compositi ʒj.
 Infusi senna comp. ʒss.
 Tincturæ sennæ ʒij.
 Tincturæ zingiberis ʒss. Misce. Bis quotidie sumendus.

HAUSTUS GENTIANÆ AMMONIATUS.

- Rj. Infusi gentianæ comp. ʒj.
 Ammonia sesqui-carbonatis gr. x.
 Rhei pulveris gr. iij.
 Tinct. lavandus comp. ʒss. Misce. Fiat haustus bis die capiendus.

PILULÆ GENTIANÆ CUM AMMONIA.

- Rj. Extracti gentianæ.
 Ammonia sesqui-carbonatis aa. Misce. Fiant pilulæ xxiv.
 Sumantur duæ bis vel ter die. For heart-burn, in gouty habits.

OFF. PREP.—Extractum gentianæ, L. E. D
 Infusum gentianæ comp. L. D. D.
 Tinctura gentianæ comp. L. E. D.
 Vinum gentianæ compositum, E.



Rumex Hydrolapathum.

RUMEX HYDROLAPATHUM.

Great Water Dock.

Class VI. HEXANDRIA.—Order III. TRIGYNIA.

Nat. Ord. HOLOGRACEÆ, Lin. POLYGONÆ, Juss. De Cand,
&c. POLYGONACEÆ, Burn.

GEN. CHAR. *Calyx* 6-sepaled, the outer three slightly coherent, the inner ones enlarged after flowering. *Stamens* 6, styles 3, and reflexed, stigmata 3, and cleft, fruit a three-cornered nut, embryo lateral, radicle superior.

SPEC. CHAR. *Petaloid sepals*, ovate-oblong, nearly entire, unequally tuberculated. *Leaves* lanceolate, acute at each end. *Whorls* almost leafless.

Syn.—*Lapathum maximum aquaticum*, sive *Hydrolapathum*, Ravi. Syn. 140; Bauh. Hist. v. 2. 986. f. 987.

Hydrolapathum magnum. Ger. Em. 389. f. 1.

Lapathum n. 1388. Hall. Hist. v. 2. 271.

Rumex aquaticus. Lin. Sp. Pl. 479; Fl. Brit. 394, Eng. Bot. v. 30. t. 2104. Hook. Scot. 112.

Rumex Hydrolapathum. Wild. v. 2. 251; Huds. Fl. Ang. ed. 2. 151.

FOREIGN.—*Le Patience aquatique*, *Herbe Britanique*, Fr.; *Labaca maior* or *larga*. Port.; *Wasserampfer*, Ger.; *Vaudskreppe*, Dan.; *Fatnsyra*, Swed.; *Wodjanoschawel*, Russ.

THE genus *Rumex* contains a numerous assemblage of hardy perennial, mostly herbaceous plants, nearly allied to *Rheum*. They have little or no pretensions to be considered ornamental, and many of them are common weeds in cultivated grounds and pastures, especially in moist situations. The roots of most of the species are astringent, and in a few the leaves are powerfully acid. Willdenow, in the last edition of the "Species Plantarum," enumerates thirty-six species, and Sprengel fifty-three, eleven of which are natives of Britain. Of these species it is necessary to mention only two as medicinal plants, viz. the great Water

Dock, *Rumex Hydrolapathum*, and the Common Sorrel, *Rumex Acetosa*, both of which are indigenous, and have long obtained a place in our national pharmacopœias. The first grows in marsh-land ditches, stagnant waters, and the margins of great rivers, throughout Europe, as well as in North America, from Pennsylvania to Virginia, but, according to Mr. Pursh, not common. With us it is very abundant and conspicuous, being by far the largest of our docks; and flowering in July and August. We found it in the greatest profusion at Whittlesea Mere, in Huntingdonshire, where the *Lycæna dispar*, or large Copper butterfly, (Curt. Brit. Entomol. v. 1. t. 12.) feeds on it in its caterpillar state.

The root is large, knotty, blackish-red externally, and furnished with numerous long hairy fibres. The stem rises about five feet in height, erect, branched, leafy, furrowed, cylindrical, and smooth. The leaves are somewhat glaucous, stalked, lanceolate, pointed, smooth, entire, but slightly curled at the edges, and tapering at the base. The radical leaves are often nearly two feet in length, and stand upon long channelled footstalks; those near the top of the stalk, small, narrow, and almost linear. The branches of the panicle are a little zigzag, beset with numerous many-flowered whorls. The flowers are drooping, on capillary pedicels of very unequal length, swelling at the top, and jointed towards the base. The perianth is divided into six segments; the outer three narrow, acute, and slightly coherent at the base. The inner three are ovate, obtuse, reticulated with prominent veins, entire, sometimes a little wavy or notched, and enlarge after flowering; each bears an oblong, reddish tubercle, varying in size and shape, and becoming most conspicuous when the seed ripens. The filaments are six, capillary, short, bearing erect, oblong, 2-lobed anthers. The germen is turbinate, and supports three capillary reflexed styles, with incised stigmas. The capsule is enclosed by the enlarged inner sepals, which by approximating assume a triangular form, inclosing a solitary ovate, acute triangular nut.—Fig. (a) front view of a flower a little magnified; (b) the sepaloid part of the perianth; (c) an anther; (d) the seed: (e) a flower with the petaloid sepals, and showing

the germen and styles; (f) the germen and styles detached.

QUALITIES.—The roots externally are blackish red; internally white, with a reddish tinge, which in drying changes in some parts to a yellowish colour. They strike a good black with a sulphate of iron, and give out their active matter both to water and rectified spirit.

MEDICAL PROPERTIES.—Amongst the ancients there was a root employed as a celebrated antiscorbutic, termed by them *Herba Britannica*, which Muntingius, in a prolix Latin work, written at the end of the seventeenth century, endeavours to prove to be the water-dock. He further states that its name *Britannica* was not derived from its English growth, but from Teutonic words, expressive of its power of fastening loose teeth, or of constringing the gums. The roots are certainly strongly astringent, and may be successfully employed for the above-mentioned purposes; and to arrest hæmorrhage from the bowels, especially when dependent on attacks of the scurvy. The leaves, which are somewhat acid, have been occasionally employed to obviate habitual costiveness.

A decoction of one ounce of the sliced root of the Patience Dock, *Rumex Patientia*, in a pint of water, is said to be extremely efficacious in obstinate ichthyosis; a disease of the skin, resembling fishes-scales.* In a full dose, it operates as a cathartic, and at the same time improves the tone of the stomach. Hence it is sometimes called Monk's Rhubarb, though that name is now given, rather to the *Rumex Alpinus*.

RUMEX ACETOSA.—Common Sorrel.

SPEC. CHAR. *Flowers* diœcious. *Leaves* oblong, arrow-shaped. *Petaloid sepals*, tuberculated.

Syn.—*Lapathum acetosum vulgare*, Rati. *Syn.* 143.

Oxalis. *Fuchs. Hist.* 464. f.

Oxalis sive *Acetosa*. *Ger. Em.* 396. f.; *Matth. Vulgr.* v. 1. 405. f.

Lapathum. n. 1597. *Hall. Hist.* v. 2. 274.

Acetosa pratensis. *Bauh. Pin.* 114.

Rumex Acetosa. *Lin. Sp. Pl.* 481; *Willd.* v. 2. 260; *Fl. Brit.* 396; *Eng.*

Bot. v. 2. t. 127; *Hook. Scot.* 113; *Woodv.* t. 69.

FOREIGN.—*Oseille ordinaire*, Fr.; *Acetosa*, It.; *Acedru*, Sp.; *Sauer Ampfer*, Ger.

SORREL is an indigenous perennial plant, common in meadows and grassy pastures throughout Europe, from the alps of Lapland to Greece; flowering early in June.

* *London Dispensatory*, 2d. ed. p. 486.

The root is long, tapering, and fibrous, sending up several stems from one to two feet high, erect, round, simple, striated and leafy. The lower leaves have long footstalks; they are oblong, arrow-shaped, blunt, and marked with two lateral teeth at the base; the upper leaves are sessile, more oblong and narrower. The stipules are tubular, membranous, and jagged at the summit. The flowers are diœcious in branched panicles, and disposed in whorls, upon short pedicels. The barren flowers are green and tinged of a reddish colour. The petaloid sepals are three, ovate, rather larger than the sepaloid ones, which latter are reflexed when in fruit. The fertile flowers are on a separate plant, and of a redder colour than the barren ones. The petaloid sepals are ovate, obtuse, red, entire, each bearing a pale oblong tubercle. The filaments are very short, furnished with large yellow 2-lobed anthers; the germen is triangular, and supports three reflexed styles with large crimson bearded stigmas. The nuts are triangular.

QUALITIES. — The leaves are inodorous, but have a very grateful acid flavour, owing to the presence of the superoxalate of potass, which may be extracted from them, and purified by crystallization. The same acidity occurs in the leaves of *Rheum compactum*, *Oxalis acetosella*, and several other plants.

MEDICAL PROPERTIES AND USES.—The expressed juice of Sorrel diluted with water, is sometimes used as an agreeable refrigerant drink in inflammatory fevers, and occasionally the leaves are boiled in milk to form a pleasant whey. They have also been employed with advantage, when eaten raw, in large quantities daily as a salad, in scurvy, and some cutaneous diseases. For culinary purposes the French sorrel, (*Rumex scutatus*, L.) being more gratefully acid, is generally preferred to common sorrel; and a third species, the *R. arifolius* of the “Flore Française,” is reckoned by the Parisians still more delicate than either of the others.



Glycyrrhiza glabra

GLYCYRRHIZA GLABRA.

Common Liquorice.

Class XVII. DIADELPHIA.—Order IV. DECANDRIA.

Nat. Ord. PAPILIONACEÆ, Lin. LEGUMINOSÆ, Juss. De Cand, &c. CICEBINÆ LOTACEÆ, Burn.

GEN. CHAR. *Calyx* bilabiate; upper-lip 3-cleft, lower undivided. *Legume* ovate, compressed.

SPEC. CHAR. *Legumes* smooth. *Flowers* spiked. *Leaflets* ovate, blunt, the terminal one on a longish stalk.

Syn.—*Glycyrrhiza vulgaris*. Ger. Em. 1302. Raii. Hist. 90. Dod. Pempt. 341.

Glycyrrhiza radice repente. Bauh. Hist. v. 2. p. 328.

Glycyrrhiza siliquosa, vel germanica. Bauh. Pin. p. 352. Moris. Hist. v. 2. p. 89.

Glycyrrhiza glabra. Lin. Sp. Pl. 1046; Wild. v. 3. 1143; Woodv. v. 2. t. 167. Lamar. Illust. 183. t. 625; Ait. Kew. ed. 2d. v. 4. p. 329.

FOREIGN.—*Réglisse*; *Racine douce*, Fr.; *Legerizia*; *liquirizia*, It.; *Regaliz*, Sp. and Port; *Süsholz*; *Lackrizen*, Ger.; *Lakris*, Dan.; *Lakrits*, Swed.; *Dubes solotkoi*, Russ; *Jét'himand'h*, Hind.

THE common Liquorice is a native of the south of Europe; but has been cultivated in our gardens ever since the time of Turner in 1562. Stowe informs us that “the planting and growing of licorish began about the first year of Queen Elizabeth.” It was formerly cultivated to a considerable extent at Pontefract, in Yorkshire, Worksop, in Nottinghamshire, and Godalming, in Surrey; but the greater part of what is now used in England, is grown at Mitcham, Battersea, Fulham, and other places near London. It flourishes most in a light sandy soil, producing its flowers in August.

The root is perennial, running very deep into the ground, and creeping to a considerable distance. When full grown it is as thick as the thumb, round, slender, flexible, and furnished with a few scattered fibres; of a brownish colour externally, yellowish, succulent, and fibrous within. From the root proceed three or four erect, herbaceous stems, of a pale green colour, and striated; with few branches, to the height of four feet and up-

wards. The leaves are alternate, pinnated, and composed of five or six pairs of leaflets, with a terminal one standing on a longish footstalk; the leaflets are ovate, blunt, veined, petiolated, nearly two inches long, and of a yellowish green colour, and clammy on the under-side. The flowers are small, bluish or purplish, and papilionaceous, standing on naked pedicels, in long axillary spikes. The calyx is persistent, tubular, cut obliquely into two lips, and divided into narrow pointed segments. The corolla consists of an ovate, lanceolate, obtuse, erect, concave *vexillum*; two, oblong, obtuse *alæ*, and a similarly shaped but shorter *carina*. The filaments are ten, nine of which are united at the base, and all of them furnished with simple roundish anthers; the germen is short, with a tapering style and blunt stigma. The legumes are oblong, smooth, compressed, pointed, and 1-celled, containing two or three small kidney-shaped seeds. —Fig. (a) a flower magnified; (b) the *vexillum*; (c) *alæ*; (d) *carina*; (e) the nine united stamens; (f) germen and style; (g) the legume; (h) a seed.

From Dr. Fleming's Catalogue of Indian plants, it appears that liquorice grows in the Bengal provinces; and Dr. Ainslie asserts it to be a product of the Malabar coast, where it is called *irattimadhiram*. The greater part, however, of what is sold in Lower India, is imported from Persia, where it grows in great abundance in the date groves near Bussora, and on the banks of the Sewund river. The roots of the wild Jamaica liquorice (*Abrus precatorius*, Lin.) a beautiful climbing shrub, resemble so much the true liquorice root in appearance and qualities, that they are often sold in India for it, and used as a substitute.

The liquorice plant is very faithfully and accurately described by Dioscorides, under the name *γλυκυρρίζα*, though he says the flower is like a hyacinth, which probably alludes to the colour only, whether his *βάκιμβρος* be the *Delphinium* or *Hyacinthus* of modern botanists. The word is compounded of *γλυκύς*, sweet, and *ρίζα*, a root, and the name in Latin, *liquiritia*, as well as the English one liquorice, the French *églisse*, the Italian *legoriza*, and all their corruptions, originate from it.

CULTURE.—The liquorice is propagated by cuttings of the small roots divided into sections, five or six inches long, each having one or more good buds. The proper season for procuring the sets for planting, is in open weather, about the middle of March. A light sandy soil is

the best adapted for this kind of crop, as its goodness consists in the length of the roots. The ground should be trenched three spades deep; then having traced out rows a yard asunder, plant the sets along each row, at intervals of eighteen inches, covering them entirely with mould. The London gardeners usually sow a crop of onions or lettuce on the same ground the first year, between the rows. During spring and summer, all weeds must be kept down by the hoe, care being taken not to cut off the top shoots of the liquorice plants, as it would greatly injure them. In the autumn, when the stems of the liquorice are in a decaying state, they should be cut down, and a very little rotten dung spread upon the surface. In the following spring, about March, the ground should be slightly dug between the rows of liquorice, burying the remaining part of the dung, being very careful not to cut the roots. During the summer they must be kept quite clean by occasional hoeing. The same operations must be annually performed, so as to keep the ground and plants in perfect order. In three years after planting, the roots of the liquorice will be fit to take up. The proper season for this is from November till February; for they should neither be taken up before the stalks are fully decayed, nor deferred till late in the spring, otherwise the roots will be apt to shrivel and diminish in weight. In taking them up, the small side roots are trimmed off, the best divided into lengths for fresh sets, and the main roots tied in bundles for sale. They are sold to the brewers and druggists; the price of the best roots varying from 40s. to 3*l*. per cwt. The *Glycyrrhiza echinata*, or prickly-podded liquorice, is sometimes cultivated, but its roots are less sweet and succulent than the official species.

QUALITIES.—Liquorice root is inodorous; it has a sweet mucilaginous taste, and is almost the only saccharine substance that does not produce thirst. It yields all its virtues to water, by coction; but alcohol extracts only the sweetness, with a small portion of mucilage. The medical properties of the root are supposed to depend on a distinct principle, to which has been appropriated the name *glycyrrhizine*. Professor Dobreiner prepares it by precipitating the infusion of liquorice by the proto-muriate of copper, washing the precipitate with water, and then boiling it in alcohol, which dissolves the glycyrrhizine, and affords it again on evaporation. It is soluble in water, and precipitated from its solution by the acids. Its taste is sweet; it is brittle, semi-transparent, and has a resinous appearance.

The *extract* is directed to be prepared by macerating for twenty-four hours, one pound of liquorice-root sliced, in a gallon of boiling water; then boiling down to four pints, straining the hot liquor, and evaporating it to a proper consistence. A purer extract may be made by a repetition of the process of solution and evaporation; and is kept in the shops under the name of “refined liquorice.” The extract is, however, usually prepared on a large scale abroad, and is imported into this country, in an impure state, particularly from Spain. The powder of liquorice usually sold, is often mixed with flour, and probably too often with substances not quite so wholesome; the best sort is of a brownish yellow colour, (the fine pale yellow being generally sophisticated,) and of a very rich sweet taste, much more agreeable than that of the fresh root.

MEDICAL PROPERTIES AND USES.—Unlike other sweets, liquorice has had the reputation from time immemorial of being a

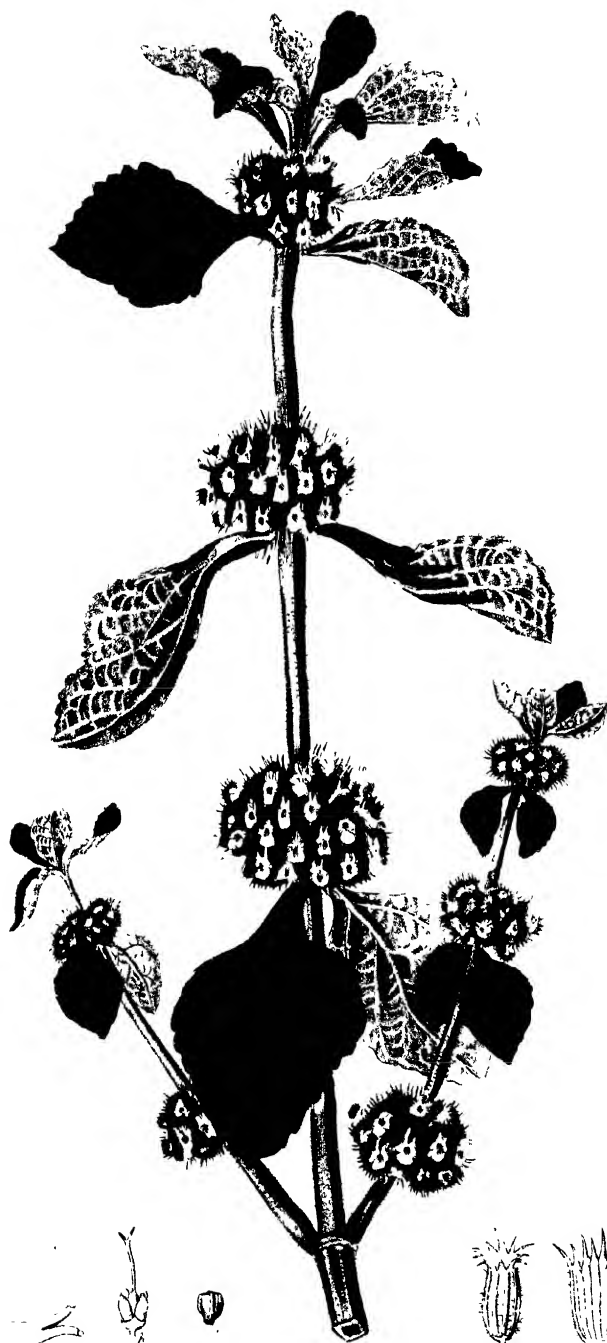
ing thirst, which property is attributed, by Cullen, to an acrid and bitter matter, which follows the extraction of the sweetness by chewing. In consequence of this virtue, it was designated by the name *ἄδιψον*, and according to Galen, it alleviates the desire for drink in dropsical cases. With us it is principally used as a pleasant demulcent, and in the form of decoction; or, combined with other mucilaginous substances, is frequently prescribed for severe colds, and for those other affections of the air passages requiring lubrication. It is also useful to obtund the acrimony of vitiated secretions in the stomach and bowels; or, as a substitute for the natural mucus of the stomach, when deficient in quantity. From its bulk it is seldom given in substance, but a tea-cupful of a decoction of the root may be frequently drank. Under the form of extract it is in common use as a demulcent, in coughs and hoarsenesses; and is sometimes taken to relieve acidity of the stomach. It is also employed to cover the unpleasant taste of several bitter and nauseous drugs, particularly aloes and Peruvian bark.

OFF. PREP.—Decoctum Sarsaparillæ. comp. *L. D.*

Infusum Lini. *L.*

Pil. Hydragryri. *L. D.*

Confectio Sennæ. *L. E.*



MARRUBIUM VULGARE.

*Common White Horehound.**Class XIV. DIDYNAMIA.—Order I. GYMNOSPERMIA.**Nat. Ord. VERTICILLATÆ, Lin. LABIATÆ, Juss.**MENTHACÆ, NEPETIDÆ, Burn.*

GEN. CHAR. *Calyx* tubular, funnel-shaped, with 10 furrows. Upper lip of the *corolla* bifid, linear, and straight.

SPEC. CHAR. *Calyx-teeth* 10, bristle-shaped, hooked.

Leaves roundish-ovate, wrinkled, unequally serrated.

Syn.—Marrubium. *Matth. Valgr. v. 2. 182. f.* ; *Camer. Epit. 573. f.* ; *Fuchs. Hist. 590. f.*

Marrubium album. *Raii Syn. 239* ; *Riv. Monop. Irr. t. 66. f. 1.*

Marrubium n. 258. *Hall Hist. v. 1. 113.*

Marrubium vulgare. *Lin. Sp. Pl. 816* ; *Willd. v. 3. 111. Fl. Brit. 636* ; *Eng.*

Bot. v. 6. t. 410 ; *Hook. Scot. 184. Bull. Fr. t. 163. Woodv. t. 97.*

FOREIGN.—Marrube blanc, Fr. ; Marrobio bianco, It. ; Marrubio blanco, Sp. ; Marroyo branco, Port. , Witte malrove, Ger. ; Andorn, Swed. ; Rubike, Hvidmarru, Dan. , Marrub ili schandra, Russ.

WHITE HOREHOUND is common in most parts of Europe as well as in Britain, on waste grounds and among rubbish particularly in warm, dry situations, flowering copiously during the latter part of the summer. Willdenow enumerates fourteen species of Marrubium, and Mr. Don, in the “Hortus Cantabrigi-ensis,” notices thirteen that are cultivated in this country, most of which are European plants. Dr. Sibthorp has also added a beautiful new species, in the “Flora Græca,” called *velutinum*.

The root is perennial, woody, and fibrous, sending up several stems, branching from the bottom, about eighteen inches high, quadrangular, leafy, and clothed with fine down. The leaves are roundish or oblong, pointed, crenate, wrinkled, veined, hoary, and stand in opposite pairs, on thick broad footstalks. The flowers are white, and produced in dense convex whorls, at the axillæ of the leaves ; they are sessile, and furnished with setaceous, awned bractæas. The calyx is tubular, funnel shaped, furrowed, and divided at the margin into ten narrow teeth, recurved at the point. the five alternate ones being smallest

linear, and cloven, the under broader, reflexed, and divided into three deep lobes, with the lateral segments acute, and the middle one broad and slightly scoloped at the end. The filaments are, two long and two short, concealed within the tube of the corolla, and furnished with small oblong anthers. The germen is 4-lobed, surmounted by a thread-shaped style, with a cloven stigma. The nuts are four, at the bottom of the calyx.—Fig. (a) is a magnified flower cut open to show the position of the anthers; (b) the germen and style; (c) a nut; (d) the calyx; (e) the same cut open; (f) a bractea.

QUALITIES.—The leaves have a strong peculiar smell of an aromatic kind, which is completely lost by keeping. To the taste they are bitter, penetrating, diffusive, and their flavour is durable in the mouth. “The infusion reddens tincture of litmus, gives a deep olive-green precipitate with sulphate of iron, a brown with nitrate of silver, and a pale yellow with corrosive sublimate; acetate and superacetate of lead do not affect it. The active principles of horehound therefore appear to be a bitter extractive, volatile oil, and gallic acid.”

MEDICAL PROPERTIES AND USES.—This plant, which is still a very popular remedy with the poor, is tonic, produces an increased flow of urine, and when taken in considerable doses is gently aperient. It was formerly much commended for asthma, jaundice, cachexy, and visceral and uterine obstructions. It has however given way to more active remedies, but although seldom employed by medical men, is said by Dr. Thompson to have been of decided use in cases of phthisis. A drachm of the leaves in powder, or an ounce of the expressed juice, are commonly ordered for a dose. The infusion is made with one ounce of the dried leaves, and a pint of boiling water, and given in the quantity of a wine-glassful twice or thrice a day.*

DECOCTUM MARRUBII COMPOSITUM.

Rj. Marrubii fol. exsicc. ʒj.

Glycyrrhizæ rad. concisæ,

Lini usitatis sem. contus. sing. ʒss.

Aquæ ferventis Ojss. Macera per horas

quatuor, et cola.—Dosis ʒj. ad ʒij.

* The nostrum sold as *Balsam of Horehound* consists, according to Paris, of infusion of horehound and liquorice root, with double the proportion of proof spirit or brandy; to which is added opium, camphor, benzoin, squills, oil of aniseed and honey.



VERATRUM ALBUM.

White flowered Veratrum, or White Hellebore.

Class XXIII. POLYGAMIA. Order I. MONŒCIA.

*Nat. Ord. CORONARIÆ, Liu. Junci, Juss. MELANTHACEÆ,
Brown. COLCHICACEÆ, De Cand.*

GEN. CHAR. *Perianth* of six pieces, sub-petaloid. *Styles* permanent. *Capsules* 3, many seeded. *Seeds*, compressed, imbricated, winged at each end. Some flowers male.

SPEC. CHAR. *Panicle* thrice compounded. *Sepals* ascending.

Syn.—*Helleborus albus flore subviridi. Bauh. Pin.* 186.

Helleborus albus vulgaris. Park. Theatr. 217.

Helleborus præcox. Ger. Em. 440.

Elleborum album, Matth. Valgr. v. 2. 559.

Veratrum flore subviridi. Tourn. Inst. 272.

Veratrum spica paniculata, floribus maribus et feminis, n. 1204. *Hall. Hist.* v. 2. t. 96.

Veratrum album. Lin. Sp. Pl. 1479; *Willd. v.* 4. 895; *Jacq. Austr. v.* 4. t. 335; *Müll. Ic. t.* 271; *Fl. Dan. t.* 1121. *Woodv. t.* 100.

FOREIGN.—*Hellébore blanc: à fleur pâle. Fr.; Elleboro bianco, It.. Vedegambre blanco, Sp.; Helleboro branco, Port.; Die weisse Niezwurzel, Ger.; Witbloemige nieswortel, Dut.; Hvit prustrot, Swed.; Tachemeriza, Rus.*

WHITE HELLEBORE is a native of the mountainous districts in most parts of Europe, from Norway to Greece, but not of Great Britain. This stately plant, accompanied by the *Gentiana lutea*, makes a magnificent appearance in rich pastures on the Alps of Switzerland, where they both grow in the greatest abundance. It is, of course, a hardy perennial, in our gardens, where it has been cultivated from time immemorial; flowering from June to August.

The root is tuberous, fleshy, brownish externally, and furnished

at the base with long, simple, white, cylindrical fibres. The stem is from two to four or five feet high, stout, erect, simple, hairy, and terminating in a large branching downy panicle, with alternate spikelets, of innumerable greenish white flowers, having little or no scent. The leaves are large, elliptical and entire, surrounding the stem at the base, plaited longitudinally, smooth, of a fine green colour, the uppermost becoming oblong lanceolate bracteas. The perianth consists of six sub-petaloid pieces, of a pale green colour, which are oblong, lanceolate, veined, spreading, of a coriaceous texture, and accompanied by an elliptical, lanceolate, downy bractea. The filaments are six, closely surrounding the germen, shorter than the corolla, diverging, and terminated by quadrangular anthers; the germen are three in each hermaphrodite flower, oblong, with spreading styles, which are terminated with bifid stigmas. The capsules are three, oblong, compressed, 2-celled, bursting at the inner edge, and containing many oblong, compressed, imbricated seeds, winged at each end. Fig. (a) represents a front and back view of a stamen and anther; (b) the three germen and styles.

The Green Veratrum (*V. viride*) a North American species, greatly resembles in its foliage and habit the White Hellebore, but the panicle is larger and greener, its branches longer and more cylindrical, spiked, not racemose, each flower being nearly or quite sessile. The sepals are also broader; their margins being thickened and mealy about the base. The Veratrum *nigrum*, or Black Hellebore, agrees with the Veratrum *album* in habit and leaves, but is somewhat taller, and is very remarkable for the very dark purplish-brown, almost black hue of its flowers, which exhale a faint cadaverous odour. It is a native of dry mountainous situations in Siberia, Hungary, Austria and Greece; flowering in July.

QUALITIES AND CHEMICAL PROPERTIES. — When recent, this root has a disagreeable odour: as met with in the shops, scarcely any. To the taste it is acrid, nauseous, and bitter, excoriating the mouth and fauces; while the powder, if applied to wounds, produces effects on the animal economy of a highly deleterious nature; as may be seen by referring to its poisonous

effects. If applied to the membrane lining the nose, it proves a violent sternutatory.

On analysis, the root of the *Veratrum album* yielded to MM. Pelletier and Caventou, 1. A fatty matter composed of oil, adipocire, and an acid similar to the sebacic, but uncrystallizable; 2. Yellow extractive colouring matter; 3. Acid gallate of *veratrine*; 4. Gum; 5. Fecula; 6. Woody fibre; the ashes containing carbonates of potass and lime, sulphate of lime and silica.

It is on the *Veratrine* that its poisonous effects depend; and these successful chemists, amongst many other brilliant discoveries, have remarked that almost all the individuals of this family of plants exert a common action over animals, owing to this principle pervading them. They first analysed the seeds of the *Veratrum Sabadilla*; isolating the *veratrine*, in which they recognised all the alkaline characters. They ultimately discovered it in the root of *Colchicum autumnale*, and in that of our plant.

PREPARATION OF VERATRINE.—They repeatedly digested the seeds of the *Veratrum Sabadilla* in boiling alcohol. These tinctures, filtrated whilst almost boiling, deposited, on cooling, whitish flakes of wax. They re-digested the matter which remained dissolved, after evaporating it to the consistence of an extract, in cold water: a small quantity of fatty matter now remained on the filter. The solution was slowly evaporated, and it formed an orange yellow precipitate, which possessed the characteristics of the colouring matter found in almost all the woody vegetables. On adding a solution of acetate of lead to the liquor, which was still deeply coloured, a new and very abundant yellow precipitate was immediately formed, which was separated by means of the filter. The liquor, now nearly colourless, still contained, amongst other substances, the acetate of lead, which had been added in excess: a current of Hydrosulphuric acid was used to separate the lead. The liquor was then filtrated and concentrated by evaporation, treated by magnesia, and again filtrated. The magnesian precipitate was digested in boiling alcohol. The alcoholic liquors yielded, on evaporation, a pulverulent substance, which was extremely acrid, and possessed all the properties of the alkalis. This substance was at first yellowish; but, by solutions in alcohol, and subsequent precipitations, caused by pouring water into the alcoholic solutions, it was obtained in the form of a very white and perfectly inodorous powder.

M. Meissner, who discovered the *veratrine* nearly at the same time as MM. Pelletier and Caventou, recommends the seeds of the *cevadilla* to be treated with undiluted alcohol, the alcoholic infusion evaporated, the residuum treated with water, the liquor filtered, and the *veratrine* to be precipitated by the carbonate of potass: it then only remains to wash the precipitate with water.

soluble in cold water ; boiling water, however, dissolves ~~two~~ of its weight, and becomes sensibly acid.

It is very soluble in ether, and still more so in alcohol. It is insoluble in the alkalis, and soluble in all the vegetable acids. It saturates all the acids, and forms with them uncrystallizable salts, which, on evaporation, take the appearance of gum. The sulphate alone affords rudiments of crystals when its acid is in excess.

Nitric acid combines with veratrine ; but if added in excess, especially when concentrated, it does not produce superoxidation, as in the cases of morphine and strychnine; but very rapidly resolves the vegetable substance into its elements, and gives birth to a yellow detonating matter analogous to the *bitter of Welther*.

Veratrine restores the blue of turnsol paper when reddened by acids. Exposed to the action of heat, it liquefies at a temperature of 50° (122° Fah.) above zero, and has then the appearance of wax : on cooling, it forms an amber-looking mass of a translucent appearance. Distilled on the naked fire, it swells up, becomes decomposed, and produces water, much oil, &c. A voluminous, carbonaceous, mass remains, which, when incinerated, leaves only a very slightly alkaline residuum.

POISONOUS EFFECTS.—Taken internally, in over-doses, white hellebore excites violent vomiting and purging, followed by copious discharges of blood from the bowels. It also produces violent effects on the nervous system, attended by great prostration of strength, anxiety, tremors, loss of voice, vertigo, syncope, deep inspirations, sinking and intermission of the pulse, convulsions, and cold sweats ushering in death.

Wepfer affirms that he administered to a puppy of three weeks old a scruple of white hellebore mixed with milk : the animal instantly vomited it, had some alvine evacuations, and a few convulsive movements ; an hour afterwards it appeared to be dead. In half an hour it was opened : the heart and diaphragm were contracting ; the interior of the stomach was somewhat red.*

Amongst many other experiments of Orfila, he made an incision in the internal part of a dog's thigh, and sprinkled the wound with 20 grains of white hellebore root finely powdered ; the lips of the wound were brought together by several stitches, and the animal was muzzled, in order to prevent him applying his tongue to the part operated on. Six minutes after, he vomited ; he lay down upon the belly, and made some moaning ; at three-quarters past eight he had already made more than twenty times violent efforts to vomit, and had thrown up some bilious mucosities : he suffered such a degree of vertigo as rendered him incapable of advancing

two steps without falling : he still retained the use of his senses, and uttered no moan : his eyelids were frequently agitated by a kind of convulsive movement. At nine o'clock he could no longer stand : the pulsations of the heart, which were strong, hurried, and irregular, did not appear to correspond with the state of stupefaction in which the animal was plunged ; he often performed the motions of deglutition. At half past nine, the eyelids and the pulsations of the heart were in the same condition ; the inspirations were very deep ; there was no convulsive movement, and the animal was so far sunk, that he might have been taken for dead. At ten o'clock the pupils began to be dilated. At one, no change had taken place ; he was shaken : he made a slight movement, and fell again instantly ; the pupils were extremely dilated, and the snapping of the eyelids went on increasing. He expired at three in the afternoon. An hour after, he was opened : there was only a slight oscillation of the heart ; the blood contained in both ventricles was fluid : the lungs, which were distended with blood, and somewhat less crepitating than in their natural state, were spotted over with some black patches : the interior of the rectum presented several black spots : the mucous membrane of the stomach was a little inflamed as well as the wound. Similar results were obtained with two other animals, except, that in one case, the digestive canal had sustained no injury.

At six in the morning, a robust dog was made to take the fluid obtained by treating an ounce of white hellebore by boiling water. This fluid had been filtered and concentrated. The œsophagus was then tied ; in five minutes the animal made efforts to vomit. At seven o'clock he began to experience a weakness in his posterior extremities ; he vacillated in walking. These symptoms went on increasing, and the animal died at eleven o'clock. He was opened the next day. The stomach contained a tolerably large quantity of thick mucus : it was very little inflamed. The mucous membrane of the rectum was of a red colour tolerably bright : the lungs exhibited livid spots ; they were dense, and but little crepitating.*

Etmuller, in the preface to his work on Surgery, states that this root, when applied to the abdomen, produces violent vomiting ; and Schreder observed the same phenomenon to take place, when this root was used as a suppository. Van Helmont also says, that a royal prince died in three hours after taking a scruple of this poison, which induced convulsions.

Similar effects, but in a much more violent degree, follow the use of *veratrine*, as the following account from Majendie's Formulary proves.

ACTION OF VERATRINE ON ANIMALS.—A very small quantity of acetate of veratrine thrown into the nostrils of a dog, instantly provokes violent sneezing, which sometimes continues for nearly half an hour.

* It has been remarked that inflammation of the rectum is a constant occurrence when the animals who have taken black hellebore root survived its administration for a few hours. The same effect also results when *Colchicum autumnale* produces

One or two grains (gr. 0.82 or 16.4 troy) placed in the gullet, immediately occasions copious salivation, which continues for some time.

If a small quantity be thrown into any part of the intestinal canal, and the body be opened to observe the effects, the intestine is found to become much indurated, and to relax and contract alternately for a certain time. The part of the mucous membrane which comes in contact with the veratrine is inflamed; the irritation spreads, and vomiting and purging are produced. In a much larger dose the substance induces a very great acceleration of the circulation and of respiration, which is soon followed by tetanus and death.

The effects are still more rapid if one or two grains (gr. 0.82 or 1.54 troy) be thrown into the pleura, or into the tunica vaginalis. In less than ten minutes death occurs, preceded by tetanic convulsions.

The same quantity thrown into the jugular vein also induces tetanus and death, in a few seconds. Dissection shows, even in this case, that the veratrine has produced an effect on the intestinal canal; for the mucous membrane is found to be highly injected. The lungs also present signs of inflammation and of engorgement.

ACTION OF VERATRINE ON MAN IN A STATE OF HEALTH AND DISEASE—The effects of veratrine in a large dose have not been observed on man; they would, however, doubtless be the same as those which are noticed in animals.

The taste of veratrine is very acrid, but without bitterness. It excites a very copious salivation, however small the quantity may be which is put into the mouth.

Though veratrine is absolutely inodorous, it is inconvenient to smell at it too closely when in a state of powder; for even the small quantity which is thus carried into the nostrils is often sufficient to produce violent sneezing, which may become dangerous.

A dose of a quarter of a grain (gr. 0.205 troy) rapidly induces very abundant alvine evacuations. If the dose be augmented, more or less violent vomiting is occasioned.

M. Orfila lately gave it in the dose of two grains (gr. 1.64 troy) in the 24 hours, without producing too many alvine evacuations. The subject of the case was an old man, who had been struck with apoplexy some time previously. This circumstance forms an additional proof of the influence which the nervous system possesses over the mode of action of medicines.

After having cautiously tasted the mixture which contained the two grains (gr. 1.64 troy) of veratrine, I experienced, for several hours, an almost insupportably acrid sensation in the mouth and pharynx, the impression of which had not entirely disappeared on the following day. The patient felt no such inconvenience.

CASES PROPER FOR THE EXHIBITION OF VERATRINE.—As veratrine produces the same effects as the plants from which it is extracted, it may be substituted very advantageously for them; because it permits the quantity of the active substance used to be estimated, which the others do not.

Veratrine is particularly applicable in cases where it is necessary to excite quickly a strong action of the bowels. When given with this intention, it has answered very well in the cases of old people, where an enormous accumulation of *fæces* exists in the large intestines.

TREATMENT.—See *Helleborus niger*, Art. XI.

MEDICAL PROPERTIES AND USES.—Like most other violent remedies from the vegetable kingdom, white hellebore was often employed by the ancients in formidable and obstinate diseases, as mania, melancholia, dropsies, epilepsy, canine madness, elephantiasis, chronic eruptions, &c. They considered it safer when it excited vomiting; Hippocrates wishing this to be its first effect: and experiments on animals prove that they were perfectly correct; as may be seen by referring to Ex. No. 1 and 2 in Orfila's Toxicology. Women and children, the aged and debilitated, and those affected with diseases of the chest, were considered as unfit objects for its administration; and as it is asserted to be capable of affording relief, when no sensible evacuation was produced, its violence was generally moderated by other combinations. In later days, Mayerne asserts that he administered from two to three grains of the extract of the root with considerable advantage in maniacal cases, where no remarkable evacuations took place; and the encomiums of Gesner, who gave it not as an evacuant, but as an alterative, led to its extensive use, and induced several authors to publish the results of their investigations.

The fullest trial was made by Greding, who employed it in twenty-eight cases of mania and melancholia, some of which derived no benefit, while others were relieved, and five recovered. In almost all these cases it acted more or less on the secretions; critical evacuations were often evident, many sweated profusely, and there was an increased secretion of urine, saliva, and the mucous discharges. Uterine obstructions of long standing were also often subjugated.

At one time, and that very lately, it was believed by many that the *V. album* was the active ingredient of that celebrated medicine for gout, the *Eau Médicinale*. Although this opinion appears fallacious, it led to its employment in that disease conjoined with opium, and we recollect many years ago to have seen it administered with considerable success; which will not appear so very remarkable to those who are aware that its active principle, veratrine, is, as already observed, a constituent of the meadow saffron. White hellebore, as an internal medicine, is again fallen into disuse. It is however still employed externally as a

local stimulant; and veratrine has been much lauded in the treatment of *tic douloureux* and various other anomalous painful affections of a chronic kind. Hellebore in powder is also used as an errhine, or in the form of decoction, or mixed in powder with lard, as an ointment in scabies, and herpetic eruptions.* As an errhine it should be very cautiously employed; and it often renders the compound sulphur ointment exceedingly irritating to delicate skins.

For internal administration the dose must not exceed two grains; and when used as a snuff, one pinch may be used every night, composed of four grains to about half a drachm of starch

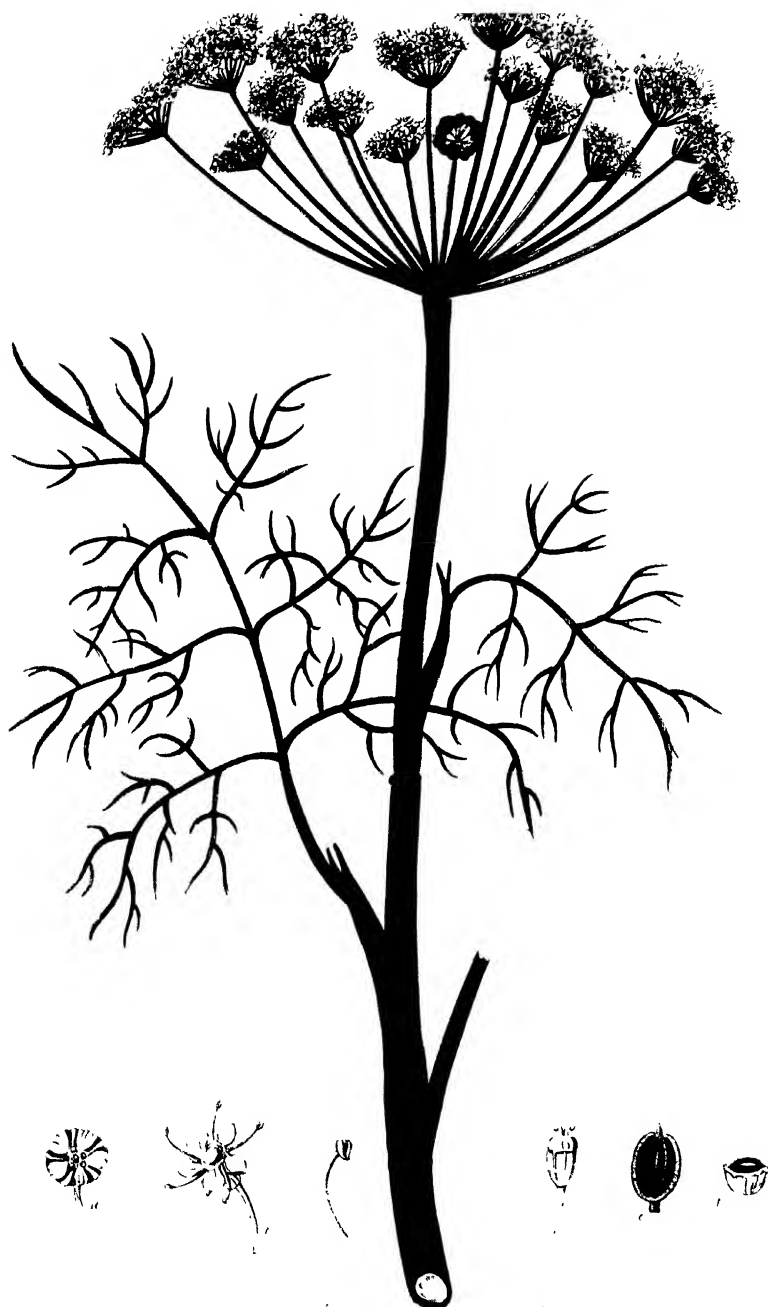
OFF. PREP.—Decoctum Veratri. *L.*

Tinctura Veratri albi. *E.*

Unguentum Veratri. *L.*

Unguentum Sulphuris comp. *L.*

* BARCLAY'S ITCH OINTMENT. The predominant ingredient in this composition, is the powder of white hellebore, slightly perfumed with essence of lemons; and it is inferior in efficacy to the Ung. Hellebori albi of the Pharmacopœias.



Anthriscum graveolens

ANETHUM GRAVEOLENS.

Common, or Garden Dill.

*Class V. PENTANDRIA.—Order II. DIGYNIA.**Nat. Ord. UMBELLATÆ, Lin. UMBELLIFERÆ, Juss. De Cand. &c.**GEN. CHAR. Fruit elliptic-oblong, compressed, with equidistant ribs. Petals obovate, involuted, entire.**SPEC. CHAR. Leaves bipinnate; leaflets awl-shaped; Seeds compressed.**Syn.—Anethum. Ger. Em. 1033; Rail Hist. 415; Camer. Epit. 517. f.; Matth. Valgr. v. 2. 115. f.; Fuchs. Hist. 30. f.**Anethum hortense. Park. 886; Bauh. Pin. 147.**Anethum graveolens. Lin. Sp. Pl. 377; Wild. v. 1. 1469, Gartn. Fruct. 1. 91; Aut. Hort. Kew. v. 2. 158; Blackw. t. 545; Lob. Advers. 347. Woodv. t. 159.**FOREIGN.—Fenouil puant, ou persil odorant, Fr.; Appio pallustre, Sello, Ital., Eneldo de olor pesado, Sp.; Dill, Ger.; Sadacopoy, Tam.; Sowa, Hind.*

DILL is a hardy biennial plant, a native of the corn fields of Spain and Portugal, and appears to have been introduced into England about the year 1570. According to Dr. Ainslie, it is also cultivated in Hindostan, where the seeds, called by the Brahmins *mishi*, are frequently sold in the bazaars of Lower India for caraway seeds. It is sometimes cultivated in our gardens as a medicinal plant, flowering in June and July.

The root is long, tapering, and whitish, striking deep into the ground, and sending up several erect, round, leafy, branching, jointed stems, rising to the height of two or three feet. The whole plant, with the exception of the flowers, is smooth, and of a deep glaucous-green colour. The leaves, as in all the plants

of this natural order, are placed alternately. They are large and doubly pinnated, upon broad, sheathing footstalks, with the leaflets linear and pointed. The flowers are produced in broad, flat, terminal umbels, of numerous general and partial rays, without either general or partial involucre. There is no calyx. The corolla consists of five equal, obovate, concave, yellow petals, with a broad, obtuse, involuted point. The filaments are five, yellow, spreading, incurved, and longer than the corolla, and bearing roundish, yellow anthers. The germen is inferior, or placed below the insertion of the petals, ovate, covered by the nectary, and surmounted by two short recurved styles, with simple stigmas. The seeds are oval, flat or much compressed, with three dorsal, equidistant prominent ribs, of a brown colour, and surrounded with a dull, pale yellow membranous expansion.—Fig. (a) represents an unexpanded flower, somewhat magnified, with the apex of the petals inflected; (b) the same fully expanded; (c) a stamen and anther; (d) the germen and styles; (e) a seed; (f) the same, cut transversely.

CULTURE.—It is raised from seed, of which, says Mr. Loudon, half an ounce is sufficient for a bed three feet by four feet. “Sow annually in February, March, or April, or occasionally in autumn, as soon as the seed is ripe to come up stronger in the spring, in any open compartment, either in drills six or seven inches apart, or broadcast thinly, and raked in evenly. The plants should remain when raised, and may be thinned moderately, should they rise too thick. They will shoot up in stalks, with leaves and seed umbels in summer and autumn, for use in proper season.”

QUALITIES.—The whole plant, particularly the seeds, which are the parts directed for use in the British pharmacopœias, have a powerful, aromatic odour, and a moderately warm pungent taste. These qualities depend on an essential oil, which is extracted by distillation with water. The seeds yield their active matter completely to alcohol, and partially to boiling water, by infusion.

MEDICAL PROPERTIES AND USES.—Like the anise and caraway, the seeds of Dill are carminative and stomachic; hence

they are used chiefly in dyspepsia, and in the flatulence to which infants are subject. They were formerly supposed to promote the secretion of milk, but this opinion is long since exploded. In India, where the plant is not uncommon, Dill seeds are given in infusion, as a stomachic, and also as a grateful cordial drink to women, immediately after parturition.

DOSE.—In powder from gr. xv. to ʒj; of the essential oil, gtt. j. to gtt. iij.

OFF. PREP.—Aqua Anethi. *L.*

ANETHUM FENICULUM.—*Common Fennel.*

SPEC. CHAR. *Leaves* tripinnate; leaflets awl-shaped, drooping. *Fruit* ovate.

Syn.—Feniculum vulgare, *Raii Syn.* 217; *Ger. Em.* 1032. f.; *Gærtn.* v. 1. 105.

Feniculum. *Camer. Epit.* 534; *Matth. Vulgr.* v. 2. 135. f.; n. 760; *Hall. Hist.* v. 1. 333.

Feniculum dulce. *Bauh. Pin.* 147.

Meum Feniculum. *Sm. Eng. Flor.* v. 2 p. 85; *Spreng. Prodr.* 32.

Anethum Feniculum. *Lin. Sp. Pl.* 377; *Willd.* v. 1. 1469; *Fl. Br.* 329; *Eng. Bot.* v. 17. t. 1208; *Woodv.* t. 160.

FORLIGN.—Fenouil, ou Anis douce, *Fr.*; Finocchio, *It.*; Eneldo hinojo, *Sp.*; Fenchelsamen, *Ger.*; Mayuri, *Hind.*

FENNEL is a biennial plant, which, though originally a native of the south of Europe, is now so completely naturalized in many parts of England, on chalky soils, that it has been admitted into the British Flora by Hudson, Withering, Smith, and other botanists. We found it plentifully in the chalk pits about Greenhithe, and also in the great pit at Charlton, in Kent.

The root is spindle-shaped, cylindrical, and whitish. The herb is smooth, and of a deep glaucous-green colour. The stems are about four or five feet in height, numerous, erect,

much-branched, solid, round, striated, jointed, and shining. The leaves are alternate, on footstalks with a broad, sheathing base; tripinnate, composed of long, capillary, acute, drooping leaflets, of a dark green colour. The flowers, like those of Dill, are in broad, many-rayed, flat, terminal umbels. The petals, five, obovate, with their points turned inward, and of a golden yellow colour; the filaments shorter than the petals, spreading, incurved, yellow, and furnished with roundish anthers. The germen is inferior, ovate; the styles are very short, and the seeds are small, oblong, very little compressed, 3-ribbed, and of a brownish-olive colour, when ripe. Three varieties are cultivated; the dark green leaved, the sweet fennel, and finocchio or Azorian fennel. The seeds are generally imported from Italy, and are reckoned superior to those of our own growth.

QUALITIES.—The whole plant has a strong aromatic odour, and a warm, sweetish, pungent taste. The seeds afford, by distillation with water, a considerable quantity of essential oil, on which their taste and flavour depend.

MEDICAL PROPERTIES AND USES.—The seeds of *sweet* fennel are carminative and stomachic; but they are scarcely ever employed in present practice. The roots of common fennel have a sweetish taste, are slightly aromatic, and were formerly ranked among the aperient roots; the tender stalks are used in salads, and the leaves enter into many fish sauces. The blanched stalks of *finocchio* are eaten as a salad by the Italians, and are likewise sometimes put into soups.

DOSE.—The dose of the bruised seed may be from ℥j to ʒj.

OFF. PREP.—Aqua Fœniculi, L. D.

Oleum Seminum Fœniculi dulcis, D.



Cucumis Colocynthis

CUCUMIS COLOCYNTHIS.

Bitter Cucumber.

Class XXI. MONÆCIA.—Order IX. SYNGENESIA.

Nat. Ord. CUCURBITACEÆ, Lin., Juss., De Cand., Burn.

GEN. CHAR. Male. *Calyx* 5-toothed. *Corolla* 5-parted. *Filaments* 3. Female. *Calyx* 5-toothed. *Corolla* 5-parted. *Pistil* 3-cleft. Seeds of the gourd with a sharp edge.

SPEC. CHAR. *Leaves* multifid. *Fruit* globose, smooth.

Syn.—*Colocyntis*. Ger. Em. 915; Raii. Hist. 642; Bauh. Hist. 2. 232; Moris. Hist. t. 6. f. 1.

Colocyntis fructu rotundo major. Bauh. Pin. 313.

Colocyntis vulgaris. Park. Theatr. 160.

Colocyntis amara cathartica. Lob. Ic. 645.

Cucurbita Indica. Camer. Epit. 293. f.

Cucumis Colocyntis. Lin. Sp. Pl. 1092; Willd. v. 4. 611, Aut. Hort. Kew. v. v. p. 334; Blackw. t. 441; Woodv. v. 3. t. 175.

FOREIGN.—*Coloquinte*, Fr.; *Coloquintida*, It.: *Pepinero Coloquintida*, Sp.; *Koloquinthen*, Ger.; *Indráini*, Hind.; *Hunzil*, Arab.; *Indiadruni*, Sans.

THIS plant, which belongs to the same genus with the rich melon for the dessert, and the cucumber well known for its cooling qualities, is a native of the Cape of Good Hope, Nubia, and Turkey; flowering from May till August. It appears to have been cultivated in this country in the days of Turner; and our figure was drawn from a specimen of the plant raised from the seeds in a hot-bed, at the Botanic Garden, Chelsea.

It is a trailing plant, bearing a considerable resemblance in its herbage to the cucumber. The root is annual, whitish,

branching, and strikes deep into the ground. The stems are slender, angular, branched, and rough, with short hairs. The leaves are on long petioles, of a triangular form, deeply and obtusely sinuated, of a bright green on the upper surface, paler and clothed with short hairs underneath. The flowers are solitary, axillary, and of a yellow colour. The calyx of the *male* flower is bell-shaped; the corolla monopetalous, bell-shaped, and divided at the margin, like the calyx, into five pointed segments; the filaments are three, two of which are bifid at the apex; they are all very short and inserted into the calyx; the anthers are linear, erect, and adhere together on the outer side. The *female* flower is like the male, but the filaments have no anthers; the germen is inferior, large, with a very short cylindrical style, and furnished with three stigmas, which are thick, gibbous, and bent outwardly. The fruit is a round berry or pepo, the size and colour of an orange, and smooth on the outside when ripe; trilocular, each cell containing numerous ovate, acute, compressed seeds, enveloped by a white spongy pulp.—Fig. (a) a male flower cut open; (b) front and back view of an anther; (c) a seed.

This plant is found abundantly in Turkey, and is supposed by many to be the plant described in the subjoined passage of holy writ. “And one went out into the field to gather herbs, and found a wild vine, and gathered thereof wild gourds his lap full, and came and shred them into the pot of pottage: for he knew them not. So they poured out for the men to eat. And it came to pass, as they were eating pottage, that they cried out, and said, O thou man of God, there is death in the pot. And they could not eat thereof.”*

Burckhardt when travelling through Nubia found the ground covered with the plant, and states that it is very common in every part of the desert; and if we recollect right, it is mentioned more than once as being met with by Major Denham in his adventurous travels in Africa.

QUALITIES AND CHEMICAL PROPERTIES.—The medullary

substance of the fruit of colocynth is the part used in medicine. It is white, soft, and porous. The seeds which are imbedded in it are nearly inert. To the taste it is intensely bitter. Boiled in water it gives out a large portion of mucilage, so as to form a liquor of a gelatinous consistence. This is less active than colocynth itself. Alcohol also dissolves only part of its active matter. Experiments seem to prove that colocynth pulp consists chiefly of mucus, resin, the bitter principle, and some gallic acid. According to M. Vauquelin, an alcoholic tincture of colocynth, yields by evaporation a brittle substance, of a yellow colour, partially soluble in water, the residue consisting of a white filamentous mass, changing to yellow. He terms it *Colocyntine*, and considers the active principle of the pulp to reside in it.

POISONOUS EFFECTS.—Given in over doses, colocynth acts as a drastic irritating purgative. Dioscorides (lib. iv. c. clxxviii.) observes, that introduced into the rectum it produced a bloody flux; and Dr. Fordyce narrates a case of a woman who was subject to colic for thirty years in consequence of taking a strong infusion in beer. Orfila says, a man swallowed three ounces of colocynth, with the hopes of curing a gonorrhœa with which he had been attacked for several days. A short time afterwards he felt severe pains in the epigastrium, and vomited copiously. At the expiration of two hours, he had copious alvine evacuations; the lower extremities became bent, his sight was obscured, and he could only hear with great difficulty: a slight delirium came on, which was succeeded by vertigo. He was made to drink a great quantity of milk, which produced vomiting: ten leeches were applied to the abdomen, and the symptoms yielded by degrees.

TREATMENT.—See Art. XI. *HELLEBORUS Niger*.

MEDICAL PROPERTIES AND USES.—Both Hippocrates and Dioscorides were in the habit of employing this remedy as a drastic purgative in dropsy, lethargy, and maniacal cases; and were well acquainted with the violence of its effects if injudiciously administered. Its doses and combinations are now well

ascertained, and although it is scarcely ever prescribed in its simple state, no cathartic is more highly prized nor oftener used than the compound extract of colocynth, which, combined with calomel, is the common aperient pill of most practitioners.

OFF. PREP.—Extract. colocynthidis. L.

Extract. colocynth. comp. L. D.

Pil. aloes cum colocynth. E. D.



Salix - Populifera

SALIX RUSSELLIANA.

Bedford Willow.

Class XXII. DICECIA.—Order II. DIANDRIA.

Nat. Ord. AMENTACEÆ, Lin. 50. Juss. 99. De Cand.

SALIACEÆ, Burn.

GEN. CHAR. Male. *Catkin* cylindrical, imbricated. *Calyx* a scale. *Corolla* none. *Nectary* 1 or more glands at the base. *Stamens* 1—5. Female. *Catkin* cylindrical, imbricated. *Calyx* a scale. *Corolla* none. *Style* bifid. *Capsule*, 1-celled, 2-valved. *Seeds* downy.

SPEC. CHAR. *Leaves* lanceolate, acuminate, serrated, smooth. *Footstalks* glandular, or leafy. *Germen* tapering, stalked, longer than the scales. *Style* as long as the stigmas.

Syn.—*Salix fragilis*. Woodv. v. 2. t. 198. 1

Salix Russelliana, Willd. Sp. Pl. v. 4. 656; Fl. Brit. 1045; Eng. Bot. t. 25. t. 1808; Hook. Scot. 279; Pursh. Mid. Fl. v. 3. 77.

THIS species of Willow is a native of wet meadows, osier-holts, and hedges, throughout the midland and southern counties of England; flowering in April or May. It was long confounded with the *S. fragilis*, and was first made known for its valuable economical properties under the name of the Leicestershire, or Dishley Willow. The late Duke of Bedford brought it much into notice for its tall, handsome, rapid growth; and the bark was also found by Mr. Biggin, an able practical chemist, to contain more of the tannin principle than any other tree, except the oak. "Hence," says Sir James Smith, "this bark, taken for *S. fragilis*, has been found useful as a substitute for *Cinchona*, in agues; and if it has occasionally disappointed some medical practitioners, they probably chanced, in such cases, to give the real *fragilis*. Tanners have sometimes been, in like manner, deceived, and they will find it worth their while to observe the character of the tree, in future, before they purchase its bark. On the other hand, when the tree in question was first recom-

mended for cultivation, by the name of the Leicestershire, or Dishley Willow, it was regarded with scorn, as "only the Crack Willow," a sort notoriously useless. This ignorance and prejudice are now removed, and *S. Russelliana* is found the most profitable for cultivation of any species of the genus, (of which sixty-four are indigenous to Britain,) for the value of its timber as well as bark, the rapidity of its growth, and the handsome aspect of the tree. A famous willow, planted by Dr. Johnson, at Lichfield, is the *Russelliana*; as I am assured by the Rev. Mr. Dickenson, who has mentioned it in his edition of Shaw's History of Staffordshire, p. 113, by the name of *fragilis*. We are obliged for the living specimens of the female plant, from which our figure was drawn, to Edward Forster, Esq., F.R.S., of Mansionhouse Street, and Hale End, Essex, Treasurer and Vice-President of the Linnean Society. We have not been able to procure the male catkins, nor have they been seen by Sir J. E. Smith.

The Bedford Willow is a tall tree, more handsome than the *Salix fragilis*. The branches are long, straight, and slender, very tough, round, flexible, and covered with a very polished bark. The leaves are lanceolate, very smooth, tapering at the base, not rounded, says the learned author of the "English Flora," nor do they at any period approach to the broad, ovate form of the crack willow, with a stouter midrib; they are strongly, and rather coarsely, serrated throughout. The footstalks are smooth, channelled, glandular, either along their edges, or about their summit, where they occasionally bear two or more lanceolate leaflets. The stipulas are half-ovate, toothed, or cut, and sometimes are altogether wanting. The female catkins are longer and more tapering than *fragilis*, and their common receptacle less downy. The calyx is oblong, either hairy or having a deciduous scale. The germen is lanceolate, tapering, smooth, on a smooth stalk; at whose base, on the inside, is a large, abrupt, solitary nectary. The style is equal in length to the deeply divided stigmas. The germen protrudes beyond the scale, nearly half its own length.

DISTINCTIVE CHARACTERS.—The whole hue of *Salix Russelliana* is lighter and brighter than that of *fragilis*, especially the leaves, which

are more firm, narrower, tapering at the base ; • their serratures more coarse and irregular, and the midrib considerably stouter. The glands on the footstalk sometimes become leaflets. The germen is longer and more tapering, with a longer stalk and style. In *fragilis*, the germen is ovate, and scarcely, if at all, longer than the scale. *Salix Errhartiana*, or the Hexandrous German Willow, bears a considerable affinity to the present species, but its leaves are much smaller, more elliptic-lanceolate, with finer, closer serratures, and the scales of the catkins shorter and rounder. This valuable species may be distinguished even in winter, from the *fragilis*, when stripped of its leaves, “ by its much more handsome and straight mode of growth, instead of the branches decussating each other, or being set on obliquely, in the very unsightly manner of that tree.”

QUALITIES AND CHEMICAL PROPERTIES.—The bark of this species of willow agrees in its sensible properties with the others, excepting that it has been found to contain a much larger proportion of tannin. It is on this account that it has been strongly recommended by Sir J. Smith, as preferable for medicinal purposes ; to which opinion we cordially subscribe. Neither this, nor the bark yielded by the *S. fragilis* and *S. caprea*, have undergone, as far as we know, any elaborate chemical analysis, but under the next subject will be found a minute detail of Bouillon La Grange’s experiment on the *S. alba*.

MEDICAL PROPERTIES AND USES.—Although the bark of the *Salix Russelliana*, is, on the authority of Sir J. E. Smith, best adapted for medicinal purposes, it was that of the *S. alba* which was first used by the Rev. E. Stone, of Chipping-Norton, whose paper in Vol. LIII. of the Philosophical Transactions introduced it to notice ; and from which we make the following extract :—“ I have continued to use it in two scruple doses, repeated every four hours between the fits, as a remedy for agues and intermitting disorders, for five years successively and successfully. It hath been given, I believe, to fifty persons, and never failed in the cure, except in a few autumnal and quartan agues with which the patients had been long and severely afflicted : these it reduced in a great degree, but did not completely take them off ; the patient, at the usual time for the return of his fit, felt some smattering of his distemper, which the incessant repetition of these powders could not conquer : it seemed as if their power could reach thus far and no farther ; and I did suppose that it would not have long continued to reach so far, and that the distemper would have soon returned with its pristine violence ; but I did not stay to see the issue. I added one fifth part of Peruvian bark to it, and with this small auxiliary it totally routed its adversary ”

SALIX FRAGILIS.—*Crack Willow*.

SPEC. CHAR. *Leaves* ovate lanceolate, pointed, serrated, very smooth. *Germen* ovate, nearly sessile, smooth. *Scales* oblong, about equal to the stamens and pistils. *Stigma* cloven, longer than the style.

Syn.—*Salix fragilis*. *Lin. Sp. Pl.* 1443; *Willd. v. 4.* 669; *Fl. Brit.* 1051; *Eng. Bot. v. 26. t. 1807*; *Hook. Scot.* 279.

THE Crack Willow is a native of Sweden, Germany, and England. With us it is not unfrequent in low marshy grounds, about the banks of rivers, flowering in May. Several trees of this species are to be seen at Milbank in Westminster; and in Battersea Fields. It is a large bushy tree, known by the crooked position of its branches, which are set on obliquely, somewhat crossing each other, and not continued in a straight line, as in *S. Russelliana*. They are round, very smooth, with a brown polished bark, and so brittle at the base in spring, that with the slightest blow they start from the trunk; but the same thing is observed in the *S. decipiens*, and several other willows. The leaves are four or five inches long, ovate-lanceolate, very smooth except when young, pointed, with blunt, often unequal, but not coarse serratures; of a dark colour on the upper surface, paler underneath, broadest towards the base, and when full grown become rounded at that part. The footstalks are smooth; seldom producing small accessory leaflets. The stipulas are half-heart shaped, and strongly serrated. The *male* catkin is pale, cylindrical, with rounded concave, downy scales, and from 2 to 5 stamens to each floret. The *female* catkin resembles the male, having the germen nearly sessile, smooth, ovate, obtuse, rather compressed, with a rounded nectary at its base, on the contrary side to the scale. The style is very short, with deeply divided spreading stigmas.

QUALITIES AND USES.—Whatever economical or medical uses have been attributed to this willow belong to the preceding, which has very generally been mistaken for it.

SALIX ALBA.—*Common White Willow.*

SPEC. CHAR. *Leaves* elliptic-lanceolate, pointed, serrated, silky on both sides; the lowest serratures glandular. *Stamens* hairy. *Germen* smooth, nearly sessile. *Stigmas* deeply cloven. *Scales* rounded.

Syn.—*Salix*. *Rati. Syn.* 447; *Ger. Em.* 1389; *Matth. Valgr.* v. 1. 180. f.

Salix alba. *Lin. Sp. Pl.* 1149; *Willd.* v. 4. 710; *Eng. Bot.* v. 34. t. 2430.

THE White Willow is indigenous, very common in moist woods, and on the banks of rivers, blossoming in May. It is a tall tree with a cracked bark, and numerous widely spreading branches, which are silky when young. The leaves are alternate, on short footstalks, lanceolate, pointed, tapering towards each end, acutely and regularly serrated, silvery and grey on both sides, with closely pressed silky hairs. The stipulas are sometimes wanting. The catkins are on short stalks, with three or four spreading leafy bracteas, cylindrical, rather slender, obtuse, about an inch and a half long, with elliptical, lanceolate, brown, fringed scales. The filaments are hairy in their lower part, with roundish yellow anthers. The germen is nearly sessile, smooth, ovate lanceolate, longer than the scale, with short, thick, cloven stigmas. The capsule is ovate, brownish, and smooth.

QUALITIES AND CHEMICAL PROPERTIES.—The bark of this, as well as of the other species, should be taken from branches about four inches in circumference. They all agree in their sensible qualities, being inodorous, but of a bitter astringent taste. The decoction of white willow bark has a dark reddish colour, and according to Boullon La Grange, when repeated decoctions are made with the same portion of bark, the last is always deepest coloured. It is precipitated abundantly by glue, carbonate of potass, and carbonate of ammonia. Lime water throws down a precipitate at first blue, and afterwards buff-coloured. Sulphate of iron throws down a very dark green precipitate. Alcohol separates white flakes. When evaporated to dryness, a reddish brittle substance remains, which has a very bitter taste, and does not attract moisture from the air. When alcohol is digested over this bark, it acquires a greenish-yellow colour. The tincture is rendered muddy by water. When evaporated, it leaves a brilliant yellow substance of a very bitter taste, which melts at a moderate heat, and emits an aromatic odour. These experiments indicate the presence of tannin, bitter principle, extractive, and gluten in this bark.—(*Annales de Chimie*, tom. 54, page 290.)

SALIX CAPREA.—*Great Round-leaved Willow.*

SPEC. CHAR. *Stem* erect. *Leaves* roundish-ovate, pointed, serrated, waved; and downy beneath. *Stipulas* somewhat crescent shaped. *Germen* stalked, ovate, silky. *Stigmas* nearly sessile, undivided. *Capsules* swelling.

Syn.—*Salix latifolia* rotunda. *Raii Syn.* 449; *Bauh. Pin.* 474.

Salix caprea. *Lin. Sp. Pl.* 1448, *Willd. v. 4.* 703; *Eng. Bot. v. 21. t.* 1448.

THE Great Round-leaved Willow is very common throughout Europe in rather dry woods and hedges, blossoming in April. This species grows to the size of a moderate tree, with spreading brown or purplish, minutely downy branches. The leaves are larger and broader than any other of the genus, of a deep green above, with a downy rib, and densely tomentose and veined underneath; they are generally broadly ovate, sometimes elliptical or rounded, pointed, either rounded or slightly heart-shaped at the base, varying in length from two to three inches, waved, and more or less serrated. The stipulas are heart-shaped, acute, serrated, and glaucous, assuming a crescent shape as the branch swells. The catkins are numerous, much earlier than the foliage, almost sessile; the barren ones much larger than in any other British species, *S. oleifolia* excepted, being above an inch long, thick, oval, and of a bright yellow colour. The scales are ovate, blackish, and very hairy. The stamens are longer than the scale, with oblong yellow anthers. The germen is ovate-lanceolate, on a hairy stalk, with the stigmas nearly sessile, oblong, thick, and undivided.

MEDICAL PROPERTIES AND USES.—The bark of these different species of Willow are all more or less tonic and astringent, and we assert from extensive experience of their use, that they are often capable of curing intermittent fevers uncombined with other medicines. They are, however, much more efficacious if united to carbonate of iron, or a small portion of cinchona bark. Willow bark is also administered advantageously in general debility; in dyspepsia and chronic diarrhœa; and is said to be very efficacious in the last stages of phthisis pulmonalis, and in hectic fever. It may be given in powder, in doses of half a drachm to a drachm, combined with aromatics, myrrh, &c. as may be required.



Vitis vinifera

VITIS VINIFERA.

Grape Vine.

Class V. PENTANDRIA.—Order I. MONOGYNIA.

*Nat. Ord. HEDERACEÆ, Lin. VITES, Juss. SARMENTACEÆ,
De Cand. VITEACEÆ, Burn.*

GEN. CHAR. *Calyx* 5-cleft. *Petals* cohering at the apex, shrivelling, deciduous. *Berry* 5-seeded; superior.

SPEC. CHAR. *Leaves* cordate, 5-lobed, sinuated, naked.

Syn.—*Vitis sylvestris*, Labrusca. *Tourn. Inst.* 613.

Αμπελος αγρια. *Diosc. lib. 5. cap. 1.*

Αμπελος οινοφορος. *EjUSD. lib. 5. cap. 1.*

Κλήμα, ή Αγριάμπελος, hodie.

Vitis vinifera. *Lin. Sp. Pl.* 293; *Willd. v. 1.* 1180; *Ait. Hort. Kew. v. 2.* 51; *Jacq. Ic. Rar. t.* 50; *Matth. Valgr. v. 2.* 655; *Camer. Epit.* 1003; *Ger. Em.* 875; *Bauh. Pin.* 299; *Woodv. t.* 195; *Fl. Græc. Subth. v. 3.* t. 242.

THE early history of the vine is involved in considerable obscurity, for the oldest profane writers that mention it, ascribe to it a fabulous origin. According to Baron Humboldt it grows wild on the coasts of the Caspian sea, in Armenia, and Georgia; and it is naturalized, at least, in most of the temperate regions of the globe. Dr. Sibthorp, to whose splendid work we are indebted for the accompanying plate, and his friend Mr. Hawkins, judged it to be completely wild on the banks of rivers in Greece. It is probable, that the culture of the vine was introduced from the east; for in the sacred writings we are told, that Noah, after coming out of the ark, planted a vineyard, and “drunk of the wine, and was drunken.” The tradition of the ancient Egyptians informs us that Osiris first paid attention to the vine, and instructed other men in planting and using it. The inhabitants of Africa ascribe the cultivation of the vine, and the art of making wine from the fermented juice of the grape, to the ancient Bacchus. Dr. Sickler, who regards this useful plant of Persian origin, has given a learned and curious account of its

The age to which the vine will attain, is supposed to equal or even surpass that of the oak ; it spreads also to a great extent, and when supported, rises to a considerable height. Pliny speaks of a vine which had existed six hundred years ; and Bosc says, there are vines in Burgundy upwards of four hundred years of age. In Italy, they are found overtopping the tallest elm and poplar trees ; and the wood of very old ones is frequently of size enough for being sawn into planks. A vine, trained against a row of houses at Northallerton, covered, in 1785, one hundred and thirty-seven square yards, and measured four feet in circumference : it was then above one hundred years old, but is now dead. That at Hampton Court, nearly of the same age, covers above one hundred and sixteen square yards : it is of the red Hamburgh sort, and is a most productive bearer, having seldom fewer than 2,000 clusters upon it every season. In the year 1816, there were at least 2,240, averaging one pound each, so that the whole crop weighed a ton, and, merely as an article of commerce, was worth upwards of £400.

Raisins, or dried grapes, are prepared either by cutting the stalks of the bunches half through, and leaving them suspended on the vine, till they become sufficiently dry ; or by gathering the grapes when they are fully ripe, and dipping them in a ley of the burnt tendrils, to which is added a small portion of slaked lime, and afterwards exposing them to the sun to dry. In the kingdom of Grenada, particularly towards Malaga, they are simply dried in the sun, without any other preparation. About 8,000 tons of raisins are annually imported into England ; and a considerable quantity of undried grapes are also imported, principally from Portugal, in jars, among saw-dust. *Currants*, of which about 6,000 tons are annually imported into this country, are small dried grapes, principally grown in the Ionian islands.

The *juice of the grape* consists of water, sugar, mucilage, jelly, albumen, gluten, super-tartrate of potass, and the tartaric, citric, and malic acids. These principles left to themselves for a short time in a medium temperature, undergo remarkable changes ; their elements assume a new arrangement, and the principal compounds which are formed are *wine* and *acetic acid*.

WINE.—When the fruit is fully ripe, it is gathered for the manufacture of *wine*, and immediately subjected to the press, in order to separate the juice from the skin and seeds. In some places, however, the grapes are permitted to remain on the vines till they wither, or are gathered and dried in the sun, before they are pressed. Thus, the celebrated Tokay wine is made of dried fruit, as are many of the luscious wines of Italy. Sometimes the juice is separated by treading the grapes with the feet, in perforated tubs or baskets, placed over the vat destined to receive the must. The expressed juice, or *must*, as it is called, is then put into a proper vessel or vat, and exposed to a temperature of at least 55 degrees, to enable it to commence the fermentative process. In a short time the liquor becomes turbid, an intestine motion is excited in it, its temperature increases, the skins, seeds, and other impurities rise to the surface, and a quantity of carbonic acid gas is disengaged. When the fermentation is finished, the spongy crust which forms on its surface falls to the bottom ; the liquor becomes clear, having lost its saccharine taste, and become *wine*. If we now examine

the liquor, we shall find that it differs essentially in its chemical and physical properties from the juice of grapes before fermentation. Its agreeable sweet taste is changed; it has not the laxative quality of must, but affects the head and occasions intoxication: lastly, on distillation with a gentle heat, a volatile, colourless, and highly inflammable liquor called *spirit of wine*, or *alcohol*, is obtained. When the juice contains too large a proportion of sugar, it is customary to add a small portion of tartar; on the contrary, if the saccharine matter be deficient, and that salt in excess, sugar is to be added. If the juice only is fermented, white wine is produced; for when the fermentation has been conducted on the skins or *marc*, red wines are obtained, both from white and coloured grapes. Great attention and practical knowledge are required in managing the fermentation properly, as on this important process depends entirely the future qualities of the wine. The same fruit in different seasons requires to be managed differently; and almost every kind of wine requires a different, and in some cases, even an opposite mode of treatment. Thus the fine *bouquet* of Burgundy is completely dissipated by a too rapid fermentation, while, on the contrary, the fermentation of the strong wines of Languedoc, celebrated chiefly for the quantity of alcohol which they contain, should be long and complete. When the sugar is not completely decomposed, or the fermentation checked, the wine retains a sweet taste; a more perfect decomposition, with a brisker fermentation, renders it strong and spirituous.

It is then put in casks, where the fermentation still continues, though in an imperceptible degree; a scum rises on its surface, and escapes by the bung-hole, which at first requires to be covered only by a leaf or tile. In proportion as the fermentation subsides, the mass of wine diminishes in bulk, and it becomes necessary to watch this cautiously, in order to supply the place with new wine, so as to keep the cask always full. In some districts, they fill up every day during the first month; every other during the second; and every eight days afterwards, till the time of racking. The effect of this insensible fermentation, is the gradual increase of the quantity of alcohol, and the separation of the tartar, which is deposited in considerable quantity in the casks, along with the colouring matter of the wine. It is of a dark red colour, very hard, and is known under the name of *argol*. When this is dissolved in water, and purified by crystallization, and reduced to powder, it forms the *cream of tartar* of commerce.

Weak wines, and those that have been too long fermented, are very apt to become sour; but the *acidity* may be corrected by the addition of sugar; or more effectually by neutralising the acid. For this purpose, the alkalies and alkaline earths, especially lime, have been employed. It was formerly the practice to use the acetate of lead to destroy the acidity in weak wines, but this murderous practice has long since been laid aside. *Ropiness* may be got rid of by exposing the bottles to the sun and air, by adding a small quantity of vegetable acid, and by fining. The *mustiness* and other ill flavours communicated by the casks or cork, may sometimes be removed by agitating the wine in contact with the air, or by the introduction of common carbonic acid gas, by pumping.

The odour and flavour of wines depend altogether on climate, soil, and the mode of conducting the fermentation: the same climate, soil, and mode of culture, often produce wines of very different qualities. Position and aspect alone, all other circumstances being the same, make a prodigious difference. The vine grows in every soil, but that which is light and gravelly, is best adapted for its cultivation. It flourishes extremely well in volcanic countries; thus some of the best wines of Italy are made in the neighbourhood of Vesuvius. The famous Tokay wine is also made in a volcanic district, as are several of the best French wines. The vine also flourishes well in primitive countries, and especially among the debris of granite rocks; thus the celebrated Hermitage wine is made from a soil of this description.

The quality and flavour of the more fully fermented wines depends principally on the mode of conducting the process of fermentation; but the sweet and half-fermented wines, derive their taste immediately from the fruit. "Malaga, Frontignac, Tokay, Vino Tinto, Montifuscone, Schiras, and the Malunsey wines of the Greek islands, are sweet to the taste, and consequently the result of imperfect fermentation; Champagne, Gooseberry, and all sparkling wines, owe their briskness to carbonic acid gas; Hock, Rhenish, Mayne, Barsac, Burgundy, Claret, and Hermitage, contain a certain quantity of uncombined acid, and are termed light and dry; while Marsala, Madeira, Sherry, and Port, are dry and strong. The odour of *Sherry* is pleasant and aromatic; the taste warm, with some degree of the agreeable bitterness of the peach kernel; the taste of *Port* is austere and bitterish; *Claret* is less rough, thinner, slightly acidulous, and highly flavoured; and *Hock* acidulous. Of the common white wines, Marsala is undoubtedly the strongest." The roughness and flavour of red wines are generally derived from the husks of the fruit, and when it is wished to impart these qualities in a higher degree, various astringent and chemical preparations are used, such as catechu, kino, logwood, rhatany root, the juice of sloes, elder-berries, &c. A yellow tint is given to many wines by means of burnt sugar: raspberries, oris-root, fir-tops, and a variety of other ingredients are employed for the purpose of communicating their respective flavours. In Madeira wines, as well as those of Xeres and San Lucar, it is the practice to use sweet and bitter almonds; hence the *nutty* flavour of many of these wines. Notwithstanding these differences in the qualities of wines, the essential principles found in all of them are the following: one or more acids, viz. the *tartaric*, the *malic*, the *citric*, the *carbonic*, and in some instances the *acetic*; extractive matter, which in old wines is deposited with the tartar, and constitutes part of what is called the crust; a *volatile oil*, on which the flavour depends; *colouring* matter; and *alcohol*. The following is Mr. Brande's valuable table representing the average quantity by measure of alcohol, sp. gr. 0.825, contained in different kinds of wine:—

Proportion of Spirit per cent. by measure.

1	Lissa, average	25.41
2	Port, ditto	22.18
3	Raisin wine, ditto	25.12
4	Marsala, ditto	25.9
5	Madeira, ditto	22.27
6	Currant wine	20.55
7	Sherry, average	19.17
8	Teneriffe	19.79
9	Colares	19.75
10	Lachrymæ Christi	19.70
11	White Constantia	19.75
12	Red Constantia	18.92
13	Lisbon	18.94
14	Malaga (1666)	18.94
15	Bucellas	18.49
16	Red Madeira, average	20.35
17	Cape Muschat	18.25
18	Cape Madeira, average	20.51
19	Grape wine	18.11
20	Calcavella, average	18.65
21	Vidonia	19.25
22	Alba Flora	17.26
23	Malaga	17.26
24	White Hermitage	17.43
25	Rousillon, average	18.13
26	Claret, average	15.10
27	Malmsey Madeira	16.40

Proportion of Spirit per cent. by measure.

28	Lunel	15.52
29	Sheraz	15.52
30	Syracuse	15.28
31	Sauterne	14.22
32	Burgundy, average	14.57
33	Hock, ditto	13.68
34	Hock (old in cask)	8.88
35	Nice	14.63
36	Barsac	13.86
37	Tent	13.30
38	Champagne, white	13.30
39	Champagne, red	11.93
40	Red Hermitage	12.32
41	Vin de Grave, average	13.37
42	Frontignac	12.79
43	Côte Rotie	12.32
44	Gooseberry wine	11.84
45	Tokay	9.88
46	Elder wine	9.87
47	Orange wine, average of six samples, made by a London manufacturer	11.26
48	Cider, highest average	9.87
	Ditto, lowest average	5.21
49	Perry, average of four samples	7.26
50	Mead	7.32

Of the wines drunk in Europe, the following are the most esteemed.

In the island of Madeira, which has long been celebrated for its wine, and Palma, one of the Canaries, there are two kinds of wine; the first called *Madeira per se*, or Canary wine, and *Palm sec*, or Palm wine. The name *sec*, (corruptly written *Sack*,) signifies dry; these wines being made from half-dried grapes. Upwards of forty thousand pipes of Madeira wine are annually exported, one half of which goes to the British settlements in the East and West Indies. The wines of Candia and Greece are of common use in Italy. *Malmsey* was formerly the produce of those parts only; but is now chiefly brought from Spain; it is a sweet wine, of a golden, or brownish-yellow colour, and to this is applied the Italian proverb, "Manna to the mouth and balsam to the brain." Almost all the wines used in the Venetian territories come from Greece and the Morea. Italy produces the *Vino Greco*, which is a gold coloured unctuous wine, and is the growth of Mount Vesuvius. In the same neighbourhood is made the *Mangiaquerra* wine, a thick blackish one called *Verracia*, and at the foot of the hill the delicious *Vino vergine*. The kingdom of Naples affords the *Campania* or *Pausillipo*, *Muscatel*, *Salernitan*, and other excellent wines, and also the *Chiarello*, much drunk at Rome. But the principal is the red, unctuous, and poignant wine called *Lachryma Christi*. The ecclesiastical state produces the bright pleasant *Albano* and the sweet *Montefiascone*. In Tuscany are the excellent white and red Florence; the celebrated hot, strong, red wine, *de Monte Puciano*, &c. In Lombardy, the *Modenese* and *Montserrat* are tolerable; between Nizza and Savona is produced an incomparable *Muscadine*. Piedmont and part of Savoy

have excellent light wines. The Sicilian and Sardinian wines are also good. Some of the wines of Spain are excellent; the greatest quantities are made in the southern part of the kingdom. The wines of the Canaries are to be met with in most of the ports of Spain, and are usually classed with the wines of that country. Although the whole of the Canaries produce excellent wines, the preference is given to those of Parma and Teneriffe. When the vintage proves favourable, Teneriffe annually produces about 30,000 pipes of *Vidonia*, or, as it is sometimes denominated, *bastard Madeira*, from the similarity of its flavour and appearance to the dry wine of that island. Teneriffe also produces a sweet wine, which is nearly similar to Malmsey Madeira. The wine of Guidas in Castile, is made from cherries, and is a species of *ratafia*. The Foucal wine, which takes its name from a village near Madrid; and the wines of *Val de Penas*, *Ciudad Real*, *Ribadavia*, *Roxa*, and those called *La Mancha*, are said to be very good. The best wine of Arragon is a red wine named *Hospital*; and *Caninea*, called likewise white *Garnachas*, is very fine, and much esteemed. The wines of Peralta, well known under the name of *Rancio*, and those of Tudela, Tafalla, and Arandillo, in Navarre, are excellent, both as to flavour and quality. The wines of Xeres, better known under the name of Sherry, are made at a town of that name, in the province of Andalusia. The flavour of leather which is sometimes perceived in tasting Sherry, is said to be owing to the custom of bringing the wines down the country in large leathern vessels, or, as the Spaniards call them, boots, whence we derive our term butts, which we bestow upon the casks in which we receive the wine. In Andalusia are made sweet and dry wines, called *Pagarete* and *San Lucar*; and the strong well-known red wine, denominated *Tinto Rota*, or *Tent*, which is an excellent stomachic. The *Montillo* is a dry wine. The territory of Xeres alone, annually produces about 60,000 pipes of wine. In the province of Granada is made the celebrated wine called *Mountain*, or *Málaga*; it is dry and sweet, both red and white. Granada also produces *Peroximenes* or *Pedro Ximenes*, which is a very fine-flavoured wine, and a kind of Malmsey which is exquisite. In Valentia is found the *Tinto Alicante*, a wine much used in France and Germany; and the *Benicarlo*, an inferior sort of red, dry, and thick wine, which is often palmed upon the public by wine dealers as Port wine. The wine called *Siches*, and that called *Garnache*, both made in Catalonia, are exquisite. In the same province are made *Tinto de las Montanas*, or Mountain Tent, and *Mataro* wine, both of which are sweet, thick, ropy, and unwholesome. It is almost needless to observe, that the wine called *Port*, of which such vast quantities are consumed in Great Britain, is the production of Portugal. The vines, whence it is made, grow upon the banks of the Douro, and occupy a space of about six leagues in length, and two leagues in breadth. These vineyards produce between 60 and 70,000 pipes of Port, and there are others which yield nearly 6,000 pipes annually. In France there are a great variety of wines, of which the strong, sweet, full-bodied spirituous ones, are called *vins de liqueur*. Languedoc and Provence afford the sweetest wines, and the same provinces, with Champagne and Burgundy, the strongest. In the province of Champagne there are two kinds of wine, the white wines called *Riviere de Marne*, and the red wines called *Montagne de Rheims*. The most cele-

brated of the French wines are *Champagne*, *Burgundy*, *Hermitage*, *Vin de baume*; the *Muscat* wines, *Frontignac*, *Lafitte*, &c. The *Vin de Laugon*, so called from a small town, near which it is made, is reckoned the best of all the wines of the Bordelais, which are included under the general name of *Vins de Grave*, from the sandy and gravelly soil in which the vines grow. A great deal of the wines made in the Bordelais, are sold under the name of *Macon*. *Auvernats*, commonly called *Casse Taille*, is made at Orleans, and is a full good wine. Another Orleans wine is *Genetin*. *Hermitage* is the produce of a vine which is grown upon the banks of the Rhone, between Valence and St. Valière. Near this also the *Côte rôtie* is made, which takes its name from the hill on which the vines grow. In Switzerland, the best wines are the *Neuf-châtel*, *Valleline*, *Lacôte*, and *Reiff*. The dry grape-wines of Upper Hungary, especially the Tokay, are in general excellent. Among the German wines, those of Tyrol are very delicate, but do not keep. Of Austrian wines, those of *Kloster*, *Newburgh*, and *Rosenburgh*, are deemed the best. In the Palatinate, the best wine is that of *Worms*. Among the most esteemed wines may be reckoned also *Rhenish*, *Mayne*, *Moselle*, *Neckar*, and *Elsas*. The Rhenish wine made in Hockheim (Hock) is regarded as the prince of German wines.

MEDICAL PROPERTIES AND USES.—The ripe fruit of the Vine is wholesome, antiseptic, and cooling, and when eaten freely, diuretic and gently laxative; grapes obviate and correct the stimulant and septic effects of animal food, open the body, and cool and refresh the system. Hence they have been found eminently useful in bilious and putrid fevers, dysentery, scorbutic affections, and in all acute, febrile, and inflammatory diseases. Grapes, when used raw, or conserved, afford a considerable quantity of bland nutritious aliment, and hence they have been highly extolled as an article of diet in pulmonary consumption. Raisins (*Uva passæ*) and currants (*Uva passæ minores*.) contain a large proportion of saccharine matter, and are highly nutritious and demulcent. They are more laxative than the fresh fruit; but when too freely indulged in, are apt to produce flatulence and cholic. Raisins are used in pharmacy to impart an agreeable sweet, and on this account enter as an ingredient into some officinal preparations, as the *Decoctum Hordei compositum*, L. D. the *Tinctura Cardamomi Composita*, L. D. and *Tinctura Sennæ*, L.

WINE is cordial, stimulant, antiseptic and tonic. In moderate quantities, it stimulates and excites the energies of the system, promotes digestion, increases the action of the heart and arteries, exhilarates the spirits, enlivens the senses, awakens the passions, and calls into action all the intellectual powers. Taken in excess it intoxicates, produces nausea, sickness, head-ache, vertigo, diarrhœa, nervous tremors, and other symptoms, which continue for two or three days. Like ardent spirit, its habitual and long continued use is equally destructive to the body and mind, producing dyspepsia, hypochondriasis, visceral obstructions, hepatic and pulmonary inflammation, gout, apoplexy, palsy, dropsy, madness, and a long and frightful catalogue of diseases.

"The action of wine on the system," says Dr. Murray,* "though

* *System of Materia Medica*, vol. i. p. 133.

analogous to that of alcohol, is not precisely alike; its stimulant operation appears to be less sudden and more durable; and hence it can be employed with more advantage as a tonic. It is as a tonic, indeed, rather than as a narcotic, that wine is administered. Its chief medicinal application is in the treatment of fevers of the typhoid type, to support the strength of the system, and to obviate symptoms arising from debility. With these views, it is given with more advantage than any other tonic,—a superiority derived from its stimulating power being obtained with more certainty, and being more easily regulated, from its being more grateful, and probably not requiring to be assimilated by the digestive organs to produce its effects. The quantity in which it is given is dependent on the state of disease; the object to be attained is that of supporting the strength of the system until the disease has run its course; the danger to be avoided is that of giving it so largely, as to occasion any degree of exhaustion. Its administration is regulated, therefore, by the effects it produces; advantage being always derived from it, when it renders the pulse more slow and firm; when the recurrence of delirium is prevented; when irritation is lessened, and sleep induced. If the pulse is quickened, and the countenance becomes flushed; if it excite thirst, increase the heat of the body, and occasion restlessness or delirium, it is obviously injurious; and the dose must either be diminished, or its use altogether suspended. In general its operation is less powerful than it is on the system in a state of health; larger quantities therefore can be taken, and are even required, to produce an exciting effect.

“In various diseases of chronic weakness, or where the strength of the system has been reduced by profuse evacuations, or by any other debilitating operation, wine is in common use as a cordial and tonic.

“Different wines have effects somewhat different, according as they are possessed of astringency, or as they are sweet or acescent; and are hence adapted to answer different indications.”

As Wine is found to be capable, by infusion, of extracting many vegetable principles; it is sometimes used in Pharmacy. From the alcohol it contains, it dissolves a certain portion of their resin, extract, and essential oil; its watery part dissolves their gum or mucilage; but medicated wines are more liable to spontaneous decomposition than tinctures; hence the London College has rejected them from the last edition of their Pharmacopœia.

OFF. PREP.—*Vini medicati, E. D.*



Juniperus communis

JUNIPERUS COMMUNIS.

*Common Juniper.**Class XXII. DIOECIA.—Order XII. MONADELPHIA.**Nat. Ord. CONIFERÆ, Lin. 51. Juss. 100. DE CAND.*GEN. CHAR. Male. *Catkin* conical. *Calyx* a scale.*Corolla* none. *Stamens* 3. Female. *Calyx* 3-parted.*Petals* 3. *Styles* 3. *Berry* pulpy, 3-seeded.SPEC. CHAR. *Leaves* acicular, 3 in each whorl, spreading. *Stem* erect.*Syn.*—*Juniperus vulgaris*, *baccis parvis purpureis*. *Raii. Syn.* 441; *Bauh. Hist.* v. 1. p. 2, 293. f.*Juniperus vulgaris fruticosa*. *Bauh. Pin.* 488.*Juniperus*. *Ger. Em.* 1372. f.; *Camer. Epit.* 53. f.; *Matth. Vulgr.* v. 1. 109. f.; *Hall. Hist.* v. 2. 319.*Juniperus communis*. *Lin. Sp. Pl.* 1470; *a*, *Willd.* v. 4. 853; *Fl. Brit.* 1085; *Eng. Bot.* v. 16. t. 1100; *Hook. Scot.* 290; *Woodv.* t. 95; *Pall. Fl. Ross.* v. 1. t. 4.FOREIGN.—*Genévrier ordinaire*, Fr.; *Ginepro*, Ital.; *Embro*, Sp.; *Gemeiner Wacholder*, Ger.

THE Common Juniper is an indigenous, evergreen shrub, growing on heaths and chalky hills, and flowering, early in May. It is extremely abundant on Banstead downs, between Croydon and Epsom; and the specimen from which our figure was designed grew on a chalky bank, by the side of the road leading from Dartford to Darenth wood, in Kent.

It is a bushy plant, extremely variable in size, smooth, more or less erect, with very numerous, rigid, subdivided, leafy, quadrangular branches. The leaves are very numerous, three in each whorl, linear, entire, sharply pointed; channelled, and glaucous on the upper surface; convex, keeled, and of a dark green colour beneath. The *male* and *female* flowers are on different plants. The catkins are axillary, sessile, conical, solitary, and furnished with three rows of whorled, imbricated, oval scales, three in each whorl, with a terminal one: the *male* flowers are of a yellowish colour at first, afterwards brown, and discharge a

copious cloud of yellow pollen. The filaments, which are found in the terminal florets only, are three, awl-shaped, united at the base, and bearing roundish anthers; in the lateral florets the anthers adhere to the base of the scale. In the *female* flowers the calyx is divided into three minute, permanent segments, united with the germen. The petals are green, rigid, acute, and also permanent. The germen is inferior, roundish, with three very short styles, and simple stigmas. The fruit is a nearly globular berry, of a bluish black colour, marked with the vestiges of the calyx and petals, having imbedded in its pulp, three angular, bony seeds.—Fig. (a) represents a catkin, magnified; (b) a scale with the anthers; (c) a female flower; (d) section of a berry, exhibiting the oily vesicles and seeds; (e) a seed.

QUALITIES AND CHEMICAL PROPERTIES.—The leaves of Juniper are balsamic and agreeable; to the taste resinous and somewhat bitter. The berries have a very agreeable odour; are soft, warm, and bitterish. They contain sugar, mucilage, a small quantity of light essential oil, of a white or yellow colour, possessing the flavour of the juniper, and a strong smell. A writer in the *Jour. Pharm.* 1827, p. 215, asserts that the berries contain an essential oil before their maturity, turpentine when ripe, and a resin when dry on the tree. Most of those which are used in this country are brought from Holland and Italy; and they should be chosen fresh, not much shrivelled, and free from mouldiness. The Italian are said to be the best. Gum Sandarach, or Vêrnix, as it is sometimes called, is an exudation from the *J. communis* growing in warm climates; though that which is generally met with in commerce is the produce of the *Thuja articulata*, or jointed Arbor-vitæ.* It is commonly used as *pounce*.

MEDICAL PROPERTIES AND USES.—Juniper berries are carminative and diuretic; and given in the form of infusion, combined with other medicines of the same properties, will often be found to act freely on the kidneys. This virtue of the berries depends on their essential oil; and as the tops of the plant also contain it, they are sometimes used. The wood is considered to be sudorific, and has been occasionally substituted for guaiacum

* Desf. *Fl. Atlas* II. p. 333. t. 252.

and sassafras. The usual dose of an infusion made with three ounces of the berries to a pint of boiling water, is a teacupful every four or five hours, to which may be added suitable quantities of extract of dandelion, or cream of tartar, digitalis, squills, &c.

Linneus states in his "Flora Lapponica," that a decoction of juniper berries, when fermented, is used in Sweden as common drink; but the assertion of some writers, that it is substituted for tea and coffee, he contradicts.

OFF. PREP.—Oleum Juniperi. L. E. D.

Spiritus Juniperi compositus. L. E. D.

JUNIPERUS SABINA.—*Savin*.

SPEC. CHAR. *Leaves* opposite, blunt, glandular in the middle, imbricated in 4 ways, the younger acute. *Stem* shrubby.

Syn.—Sabina. *Dod. Pempt.* 854; *Blackw. t.* 214.

Sabina folio cupressi. *Bauh. Pin.* 487; *Ratii Hist.* 1415; *Duham. Arb.* 2. t. 62.

Juniperus Sabina. *Lin. Sp. Pl.* 1472; *Willd. v.* 4. 852; *Gouan. Hort.*

Munosp. 510; *Scop. Carn.* 1228; *Ait. Kew. v.* 5. p. 414; *Woody, t.* 259.

FOREIGN.—Sabine, Fr.; Sabina, It. and Sp.; Stinkender, Wacholder, Ger.

SAVIN is a native of the south of Europe and the Levant: it is, however, a hardy shrub, and was cultivated here by Turner in 1562, and probably much earlier. The flowers resemble those of the preceding species, and appear in May and June.

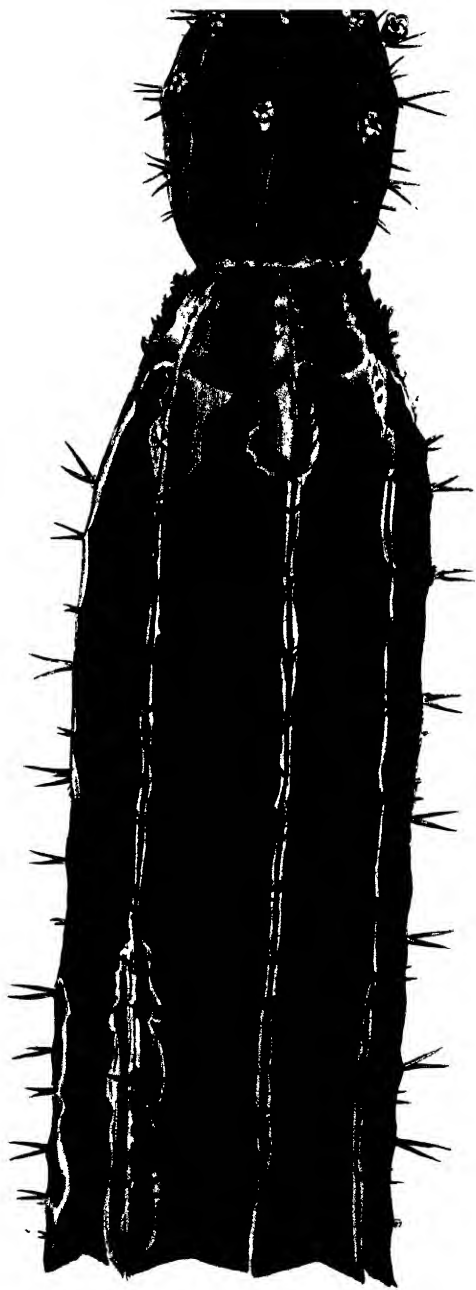
It is commonly of humble growth, but sometimes forms a handsome dark evergreen bush, three or four feet high, with a trunk a foot in diameter. It is covered with a reddish-brown bark, and sends off many branches, which are numerous subdivided. The leaves are very small, numerous, erect, opposite, pointed, of a bright green colour, and wholly invest the younger branches, which terminate in sharp points. The *male* catkin is conical, and consists of three opposite florets placed in a triple row, and a terminal one at the end; and at the base of each flower is a broad oval scale, fixed laterally to a columnar pedicel. There is no corolla. The filaments in the terminal flower are three, awl-shaped, and united at the base, with roundish anthers;

but in the lateral flowers the filaments are scarcely distinguishable, and the anthers are sessile. In the *female* flower the calyx is composed of three minute scales,² united with the germen: the petals are three, rigid, acute, and permanent; and the germen supports three styles with simple stigmas. The fruit is a roundish, fleshy berry, of a blackish purple colour, marked with tubercles, and containing three small, irregular-shaped, hard seeds.

QUALITIES.—The leaves and tops of savin have a foetid and oppressive odour, and a hot, bitter, and acrid taste. They give out a great part of their active matter to watery liquors, and the whole to rectified spirit; tinging the former of a brownish, and the latter of a dark green colour. Distilled with water they yield a large quantity of essential oil, on which the activity of the plant depends.

MEDICAL PROPERTIES AND USES.—Savin is a powerful stimulant, and was once much employed as an emmenagogue. A strong decoction and the powder have often been given in large doses, with a view to procure abortion; but if it be capable of producing such an effect, which is very doubtful, it is when it acts as a hydragogue purgative. Externally, the powder is occasionally used to destroy warts and other excrescences; and although much of the acrimony of the plant is destroyed by drying, and by the heat employed in boiling the fresh tops to compose the ointment of the shops, enough is still retained to render it an efficacious application to blistered surfaces, when it is desirable to keep up a discharge; whether the salve be made as directed by the London and Dublin Colleges, or by combining a portion of the powder with lard. Under its operation, the discharge assumes a puriform character, and so concretes on the surface as to require to be removed, from time to time, to admit the full action of the application. Of the powder the dose is ℥j to ʒj. In America, the *Juniperus Virginiana*, or Red Cedar, which can scarcely be distinguished by experienced botanists from savin, produces precisely the same effects, and is used in the same manner.

OFF. PREP.—Ceratum Sabinæ. L.E.D. Extract: Sabinæ. D. Ol. Sabinæ. E. D.



Euphorbia officinarum

EUPHORBIA OFFICINARUM.

Officinal Spurge.

Class XI. DODECANDRIA.—Order III. TRIGYNIA.

Nat. Ord. TRICOCCÆ, Lin. EUPHORBIAE, Juss. EUPHORBIACEÆ,
De Cand. EUPHORBIDÆ, Burn.

GEN. CHAR. *Corolla* four or five-petalled, fixed to the calyx. *Calyx* 1-leafed, ventricose. *Capsule* tricocous.

SPEC. CHAR.; *Aculeate*, naked, many angled; prickles in pairs, spreading, equal.

Syn.—Euphorbium. *Ger. Em.* 1178. f. 1; *Park.* 224; *Raii Hist.* 872; *Bauh. Pin.* 387; *Dod. Pempt.* 378. f.; *Blackw. Trew. Cent.* 3. t. 340. f. 2; *Tabern.* 104.
Euphorbia tenella planta. *Lob. Ic.* 2. t. 25; *Advers. v.* 2. t. 28.
Poisonous Gum Thistle. *Ger. Em.* 1178. f. 1.
Euphorbium cerei effigie caulibus crassioribus spinis validioribus armatum.
Moris. Hist. p. 85. t. 37. f. 6; *Seba Thes.* 1. p. 29. t. 19. f. 2.
Euphorbium polygonum spinosum cerei effigie. *Isn. Act. Acad. Scien.* 1720. p. 385. n. 4. t. 10.
Euphorbia officinarum. *Lin. Sp. Pl.* 647; *Willd. v.* 2. 881; *Amæn. Acad.* 3. p. 107; *Plenck. Icon.* t. 365; *Ait. Kew. v.* 2. p. 106; *Decand. Pl. Grasses,* t. 79.

THIS very singular prickly latescent shrub is a native of Africa, where it grows in great abundance; and is the plant, together with the *E. Canariensis* and *E. Antiquorum* &c. from which the resinous substance known by the name of euphorbium, is chiefly obtained. It belongs to a very extensive natural genus of herbaceous, or shrubby plants, abounding in an acrid milky juice, of which about thirteen are indigenous to this country. It is the *εὐφορβιον* of the ancient Greeks; and it was so named after Euphorbus, physician to Juba, king of Lybia. The Officinal Euphorbium plant is cultivated in our hot-houses, and is said to have been introduced about the year 1597. Our figure, which represents a flowering branch, was made from a fine specimen in the collection of Mr. C. Law, of Stoke Newington.

The roots are small, whitish, cylindrical, and spreading. The stem is erect, thick, shrubby, succulent, with about eight obtuse angles, and furrowed with many longitudinal fissures; it is simple, or branched towards the top, entirely destitute of leaves, and rises to the height of four or five feet. The branches are more distinctly angled than the stem, of a dark green colour, sometimes with whitish dots, scolloped, and armed with sharp spines everywhere double. The flowers are yellowish-green, solitary, almost sessile, on the extremities of the branches at each pair of spines. The calyx is of one leaf, bell-shaped, persistent, yellowish, with five marginal teeth. The petals are four, turbinate, gibbous, thick, and attached by claws to the margin of the calyx. The filaments are about twelve, capillary, erect, longer than the corolla, and supporting distinctly two-lobed anthers. The germen is roundish, three-lobed, with three short, spreading, permanent styles. The capsule is three-lobed, bursting elastically, and containing three roundish seeds. Fig. (a) represents a flower; (b) the germen and styles.

QUALITIES AND CHEMICAL PROPERTIES.—Euphorbium, applied in a small quantity to the tongue, discovers a sharp, biting taste; and retained in the mouth, it proves highly acrimonious, inflaming and ulcerating the parts. “When the tree grows old,” says Bruce, “the branches wither; and in place of milk, the inside appears to be full of powder, which is so pungent, that the small dust which I drew upon striking a withered branch, seemed to threaten to make me sneeze to death, and the touching of the milk with my fingers excoriated them as if scalded with boiling water.”

According to Dr. A. T. Thompson, its specific gravity is 1.124. Water, when triturated with it, is rendered milky, but dissolves one-seventh part only of the quantity employed: alcohol dissolves one fourth, and affords a clear straw-coloured tincture, which is rendered milky by the addition of water. Ether takes up six parts in ten; and when the ethereal tincture is evaporated on water, it leaves on the side of the glass a pellicle of transparent resin, and on the water a cake of opaque adhesive whitish matter, which he found to consist of wax and resin.

ANALYSIS OF EUPHORBIIUM.

(Braconnot *Ann. Chim.* lxxiii.)

Resin	37.0
Wax	19.0
Malate of Lime	20.5
— Potass	2.0
Woody matter	13.5
Water and Volatile Oil	5.0
Loss	3.0
	<hr/>
	100.0

(Pelletier *Bull. Pharm.* i.)

Resin	60.80
Wax	14.40
Malate of Lime	12.20
— Potass	1.80
Woody Matter & Bassorine * . .	2.00
Water and Volatile Oil	8.00
Loss	0.80
	<hr/>
	100.00

The difference in the result of the labours of these celebrated chemists, can only be accounted for by the difference in the gum-resin on which they experimented. The resin which they isolated is transparent and of a reddish colour, insoluble in alkalis, and when dissolved in sulphuric and nitric acids, appears to differ essentially in its properties from all other resins. Euphorbium is obtained by making slight incisions in the plant, from which exudes a milk-like juice, that concretes into oblong or roundish tears.

POISONOUS EFFECTS.—From experiments on animals, M. Orfila infers—First, That Euphorbium exerts a local action extremely violent, capable of producing acute inflammation. Secondly, That its fatal effects depend rather on sympathetic irritation of the nervous system, than on its absorption. Thirdly, That it acts on the human species as on dogs.

We know of but one case in which euphorbium was taken as a poison by a human being. It is recorded in the *Philosophical Transactions* for 1760. It states that Mr. Willis took, by mistake, two ounces of the tincture of euphorbium, prepared with two drachms of camphor, two ounces of rectified spirit, and two

* *Bassorine* is obtained from those gum-resins that contain it, by treating them successively with water, alcohol, and ether. Being insoluble in these liquids, it remains mixed merely with the woody particles, from which it is easy to separate it, by repeated washings and decantations; because one of its characteristics is to swell extremely in water, and to become very buoyant. This substance swells in cold as well as boiling water, without any of its parts dissolving. It is soluble however, almost completely by the aid of heat, in water acidulated with nitric or muriatic acid. If, after concentrating with a gentle heat the nitric solution, we add to it highly rectified alcohol, there results a white precipitate, flocculent and bulky which washed with much alcohol and dried, does not form at the utmost the tenth of the quantity of bassorine employed, and which presents all the properties of gum arabic.—Vauquelin *Bull. Pharm.* iii. 56.

drachms of euphorbium. Mr. Willis was administered, a few minutes after, larger quantities of warm water, which produced copious vomitings. The patient complained of a burning heat at the stomach, when he was made to drink oil and water alternately, the vomitings continuing. Some time after, Mr. Dymock ordered an ounce of ipecacuanha wine, which procured copious evacuations from the stomach and bowels; and milk, and an opiate, soon restored tranquillity. Orfila seems to think, that the ill effects experienced, may be in some measure attributed to the camphor.

Scopoli asserts, that the Leafy-branched Spurge, *Euphorbia Esula*, produced death in a woman who half an hour before had swallowed thirty grains of the root. He also states that he has seen gangrene of the abdomen, and death succeed quickly, to the imprudent application of it to the abdomen.

MEDICINAL PROPERTIES AND USES.—Euphorbium is cathartic and emetic, but its operation is so violent that it is never employed. It is the most violent errhine we possess, occasioning a copious secretion from the nostrils, followed by a sense of heat, and occasionally by hæmorrhage and inflammation. When a minute portion is mixed with powdered starch, and cautiously taken as snuff, it has been found useful in lethargy, deafness, paralysis, amaurosis, and various anomalous affections of the head. But for a more particular account of the action of errhines, and of the caution required in their employment, we must refer our readers to our account of *ASARUM EUROPÆUM*, Art. xxiii.

Many other species of this extensive genus have been employed in medicine, amongst which the *Euphorbia Lathyrus*, or Caper Spurge, has lately excited considerable attention on the continent. Its seeds have been proposed as a substitute for ipecacuanha, and the oil expressed from them may, according to Dr. Carlo Calderini, be advantageously substituted for that of the *Croton Tiglium*.

When the seeds are very ripe, they are to be dried and separated from the black ones, which will turn rancid. The oil is obtained by simple pressure: fourteen ounces of the seeds yield six of very fine oil, which much resembles castor oil. It has the

same colour, but is not quite so heavy ; it is void of odour, is not acrid, nor has it an unpleasant flavour ; it is very transparent. With lime, especially in hot weather, it soon becomes rancid and turbid, and acquires a pungent taste. It does not dissolve in alcohol. It forms soap with the alkalies.

It acts, says the Italian author, as a very mild purgative, producing neither vomiting, cholic, or tenesmus. The dose for adults is from four to eight drops. To children of two or three years old, two or three drops are administered in a cup of chocolate. Almond emulsion, and water, sweetened with sugar, also form good vehicles for it.

In America, the *Euphorbia Ipecacuanha* and *E. corollata*, or Great-flowered Spurge, are used medicinally. Dr. Bigelow, in his valuable work, gives figures of them ; and from him we give the subjoined account of their effects.

The *Euphorbia Ipecacuanha*, in doses from ten to twenty grains, is both emetic and cathartic, is more active in proportion to the number of grains administered, and in small doses operates with as much ease as most emetics, in a majority of instances. If it fails, however, at first, it is not so safely repeated as the other emetics in common use. Given in large doses it excites active and long continued vomiting, attended with a sense of heat, vertigo, indistinct vision, and prostration of strength.

The *Euphorbia corollata* is a very certain purgative, possessing about double the strength of jalap. It exerts its cathartic effects in doses of less than ten grains. If given to the amount of fifteen or twenty grains, it is very sure to prove emetic ; the proportion of its failures not being greater than occurs in the use of other emetic medicines. The only inconvenience attending it appears to be, that if given in small doses as a purgative, it is apt to produce nausea ; while in large doses suitable for an emetic, it has sometimes induced hypercatharsis.

The milky juice of the *Euphorbia helioscopia*, Sun Spurge, or Wart-wort, is used in many parts of Britain as a stimulating application for destroying warts and other excrescences. Having procured four pounds of the leaves of this plant, which abounds in every waste ground, we submitted it to pressure, and obtained

nearly two ounces of juice, which, when evaporated in a water-bath, produced ten drachms of extract, resembling that of the white poppy both in colour and consistence. The expressed juice, when fresh, is of a dirty brown colour, and after two ounces of it had stood a few days in a phial lightly corked, a pungent odour escaped, not unlike that which is yielded by nitric acid.

Oct. 18, 1826, we gave half an ounce of the juice to a kitten, and the same to a full grown rabbit, which produced no visible effects on either.

19th. The kitten having been kept without food since yesterday, appears to be quite well. Four drachms of the extract were therefore rubbed down with a small quantity of distilled water, and half the quantity was administered to it. Immediately the animal was released, it fell from the table on the floor, and remained on the same spot, on its side, till it died, at the expiration of half an hour. Its limbs moved but little, and those motions were not convulsive, but evidently efforts to rise. Inspirations were first made at intervals of twenty seconds; shortly afterwards at more lengthened periods, but just prior to death were short and frequent: neither vomiting nor purging was produced. The pupil was from the first dilated to its full extent, and so remained to the last.

Six hours after, we examined the stomach, which contained nothing but the poison; and this had produced no apparent effects on that organ; for not a blush was to be seen on the whole surface of its mucous membrane, nor on that of the œsophagus. The lungs were flabby, but the right side of the heart and the venous system were gorged with uncoagulated blood. The brain was minutely inspected, but we discovered no unusual turgescence of vessels.

Ten grains dissolved in water produced no effects on a kitten of the same litter.

All the *Euphorbiæ* are lactescent, and Dioscorides states, that in old practice the juice was dropped into the eye to remove opacity of the cornea, and also into wounds to destroy the venom of the scorpion.



Eryngium maritimum.

ERYNGIUM MARITIMUM.

Sea Eryngo, or Sea Holly.

Class V. PENTANDRIA.—Order II. DIGYNIA.

Nat. Ord. UMBELLATE, Lin. 45. UMBELLIFERE, Juss. 60.

SANICULEE, Burn.

GEN. CHAR. *Flowers* sessile, capitate. *Petals* oblong, equal, inflexed. *Receptacle* conical, scaly. *Fruit* ovate, bristly.

SPEC. CHAR. *Radical leaves* roundish, plaited, spinous.

Scales of the receptacle 3-cleft.

Syn.—*Eryngium marinum*. *Rail Syn.* 222; *Ger. Em.* 1162.f.; *Camer. Epit.* 448.f.;

Dod. Pempt. 730.f., *Matth. Valgr.* v. 2. 42.f.; *Bauh. Hist.* v. 3. 86.f.

Eryngium maritimum. *Lin. Sp. Pl.* 837; *Willd.* v. 3. 1358; *Fl. Brit.* 288;

Eng. Bot. v. 10. t. 718; *Bauh. Pin.* 386; *Hook. Scot.* 87; *Woodv. t.* 102.

FOREIGN.—*Du Panicaud Des Champs*, Fr.; *Eringio*, Ital.; *Eryngo*, Span.,

Dracher distel. Ger.

THIS is a perennial plant, growing abundantly on the sandy sea-shores throughout Europe; flowering in July and August. The specimen from which the annexed figure was drawn grew at Mersea island, on the Essex coast, where we also found *Hyoscyamus niger*, *Lepidium latifolium*, *Glaucium luteum*, *Inula crithmoides*, *Convolvulus Soldanella*, and several other rare, or very local, British plants.

Sea Holly has a creeping, cylindrical, whitish root, as thick as an ordinary finger, and so long that it is with difficulty plucked up entire. The stem rises to the height of twelve inches or more; it is round, branched, thick, leafy, and striated. The radical leaves are roundish or kidney-shaped, stalked, plaited, and 3-lobed; those of the stem are sessile; and the whole are smooth ribbed, veiny, of a pale glaucous or sea-green colour with an elegant blue tint, and toothed with sharp spines, like those of the holly, from which the plant has obtained its English name. The flowers are disposed on the summit of the stem and branches in dense conical heads, like those of thistle. They are small, numerous, of a bright blue colour, and separated from each other

by little rigid, chaffy scales, and encompassed with a large pinatifid spinous involucre. The scales, one of which accompanies each sessile floret, are three-toothed, longer than the florets, and spinous. The calyx is superior, and consists of five erect, pointed, equal leaves. The corolla is composed of five equal, oblong, channelled petals, with their points turned inwards. The five filaments are capillary, longer than the corolla, bearing oblong anthers; the germen is ovate-oblong, clothed with erect bristles, and furnished with two filiform, nearly erect styles, and simple stigmas. The fruit is bristly, separable lengthwise into two parts, and consisting of the like number of oblong, nearly cylindrical seeds. Fig. (a) represents a flower magnified; (b) the same, showing the inflexed petals, &c.; (c) a petal; (d) the styles; (e) the 3-cleft scale. .

QUALITIES AND MEDICAL PROPERTIES.—Eryngo root has a sweet, agreeable taste and aromatic smell; and it gives out its properties to water. This root was formerly supposed to be possessed of many virtues. Boerhaave reckons it as the first of aperient diuretic roots, and it has been recommended in gonorrhœa and visceral obstructions; particularly of the gall-bladder and liver. Menstrual suppressions are reported to be removed by it, and quartan agues are likewise stated to have yielded to it. To crown its other virtues, it is much esteemed for its supposed aphrodisiac qualities; and at Colchester, where the candied root is prepared, considerable quantities of it are still sold, we are informed, in consequence of her Majesty Queen Charlotte being presented with a box of it, as she passed through that town on her first arrival in England. It is now little used by medical practitioners; but while we are taught to believe by respectable authorities that two grains, and even one, of blue pill for a dose, can act beneficially on the system, we see no reason why this root and many others should be destitute of all virtue, when properly administered and judiciously persevered in, even though their direct effects on the system manifest themselves in no very evident manner.

The *E. campestre*, or Field Eryngo, with deeply divided leaves, which grows naturally in our meadows and pastures adjoining the sea, is said to possess the same qualities and medical properties, and is preferred on the continent.



GEOFFROYA INERMIS.

Smooth Bastard Cabbage-tree.

Class XVII. DIADELPHIA.—Order IV. DECANDRIA.

Nat. Ord. PAPILIONACEÆ, Lin. LEGUMINOSÆ, Juss., De Cand.

GEN. CHAR. *Calyx* 5-parted. *Drupe* ovate. *Nucleus* compressed.

SPEC. CHAR. Unarmed. *Leaves* pinnate; *leaflets* ovate—*lanceolate*, smooth.

Syn.—*Andira Ibaariba*, sive *Angelin*. *Piso Bras.* t. 81.

Geoffroya inermis, foliis lanceolatis. *Swartz Prodr.* 106.

Cabbage Bark-tree, or Worm Bark-tree. *Wright in Phil. Trans.* v. 67 t. 10.

Geoffroya inermis. *Lin. Sp. Pl.* 1043; *Willd.* v. 3. 1130, *Woodv.* v. 2. t. 112; *Aut. Kew.* v. 3. 52; *Jacq. Amer.* t. 180.

FOREIGN — *Umari de la Jamaïque*, Fr.; *Geoffroya*, It.; *Geoffroyrinda*, Ger.

THE Smooth Geoffroya, or Bastard Cabbage-tree, universally known in the West Indies by the name of the Worm Bark-tree, is a native of Jamaica and Martinique, growing in the low savannas. It is a lofty tree, whose wood is white, and so tough as to be preferred beyond all others for the shafts of carriages. It was first introduced into this country by Messrs. Lee and Kennedy, who cultivated it at Hammersmith about the year 1778.

This tree rises to a considerable height, sending off several branches towards the top of a straight, smooth trunk. The external bark is smooth and grey; internally it is black and furrowed. The leaves are pinnate; composed of six or seven pairs of lanceolate-acuminate, smooth leaflets, about three inches long, of a dark green colour, standing in pairs on short foot-stalks, with a terminal one. The flowers are disposed in very large,

consequently is less liable to induce narcotic effects. It is of a ferruginous colour, with reddish-brown *striae*, while the other is grey externally, and yellow internally, the latter colour turning somewhat black by age. The Surinam cabbage-bark may also be distinguished from the other by having a *sour* as well as bitter taste; and while the Jamaica bark smells so disagreeably as to be called by some the *bilge-water tree*, the former has a less nauseous odour, and loses it in dessiccation.

M. G. T. Huttenschmid has furnished the public with a comparative analysis of the two barks, which has not, we believe, been hitherto published in any English work.

<i>G. Jamaicensis.</i>	<i>G. Surinamensis.</i>
Colouring principle.	Astringent oxidated principle.
Gum.	Green astringent chalybeate principle.
Starch.	Gum.
Wax.	Starch.
Resin.	Malic acid.
Carbonate and phosphate of lime.	Alkaline carbonate.
Carbon.	Muriatic and sulphuric acid.
Phosphorus.	Phosphate and oxalate of lime.
Sulphur.	Magnesia.
Silex.	Oxide of iron.
Oxide of iron.	Manganese.

OFF. PREP.—Decoctum Geoffroyæ inermis, D.

simple, pubescent, rising to the height of three or four inches, and terminate in a fleshy, expanded, flat, quadrangular receptacle, about an inch long, and three-fourths of an inch broad, placed vertically, covered with many minute, scarcely conspicuous flowers immersed in its substance, and occupying the whole of its disc. The flowers are male and female intermixed. There is no corolla. The calyx of the female flowers, according to Dr. Stokes, is prismatic, with four teeth inflected horizontally; that of the male flowers bipartite, very short, concave, and erect. The filaments are awl-shaped, with roundish anthers. The germen is roundish, with a bifid style, and simple stigmas. The seeds are solitary, triangular, and pointed. The capsule, when ripe, possesses an elastic power, by which the seed is thrown out with considerable force. Fig. (a) exhibits a portion of the receptacle, with the flowers considerably magnified; (b) a seed.

QUALITIES.—The dried roots have an agreeable aromatic smell; a rough, bitterish, warm, acrid taste. By the assistance of heat, both water and alcohol extract their virtues. The watery decoction is of a dark brown colour, and very mucilaginous.

MEDICAL PROPERTIES AND USES.—Contrayerva, which has generally been regarded as stimulant, sudorific, and tonic, is now seldom prescribed. It has been recommended, on the authority of Pringle, Huxham, and other eminent physicians, as a useful remedy in fevers of a typhoid character, in malignant eruptive diseases, and in chronic dysentery, and diarrhœa. It has also been found useful in atonic gout, in chronic rheumatism, and in some other diseases. Dr. Cullen observes, that wine may always supersede the stimulant power of this medicine in fevers, and that debility is better removed by the tonic and antiseptic powers of cold and Peruvian bark, than by any stimulants. The compound powder of contrayerva made up into balls, and called *lapis contrayervæ*, was formerly employed in typhoid fevers, small-pox, and other diseases of the malignant kind.

DOSE.—Of the powdered root, the dose may be from gr. xv. to 3fs.

OFF. PREP.—Pulvis Contrayervæ compositus, L.

The root is perennial, woody, and furnished with numerous blackish fibres; sending up several erect, leafy, slender, reddish, wand-like stems, three or four feet high, quadrangular, and sometimes hexagonous near the root. The whole plant is gene-

Holcus mollis.	Chærophylum sylvestre.	Rubus fruticosus.
Glyceria aquatica.	Bunium flexuosum.	— corylifolius.
— fluitans.	Sium angustifolium.	Potentilla anserina.
Poa trivialis.	— nodiflorum.	— reptans.
— pratensis.	— repens.	Geum urbanum.
— annua.	— latifolium.	Papaver hybridum.
Briza media.	Æthusa Cynapium.	— Rhœas.
Dactylus glomerata.	Conium maculatum.	Thalictrum flavum.
Cynosurus cristatus.	Coriandrum sativum.	Ranunculus ficaria.
Festuca loliacea.	Oenanthe fistulosa.	— sceleratus.
— pratensis.	— crocata.	— bulbosus.
— elatior.	Phellandrium aquaticum.	— repens.
Bromus secalinus.	Ægopodium Podagraria.	— acris.
— mollis.	Angelica sylvestris.	— aquatilis.
— racemosus.	Heracleum Spondylium.	Caltha palustris.
— sterilis.	Sambucus nigra.	Ajuga reptans.
Arundo Phragmites.	Juncus glomeratus.	Mentha hirsuta.
Lolium perenne.	— effusus.	Glechoma hederacea.
— temulentum.	Luciola campestris.	Lamium album.
— arvense.	Rumex crispus.	— purpureum.
Hordeum murinum.	— obtusifolius.	— amplexicaule.
— pratense.	— Acetosa.	Galeopsis tetrahit.
Triticum repens.	— Acetosella.	Stachys sylvatica.
— caninum.	Triglochin palustre.	Ballota nigra.
Scabiosa arvensis.	Alisma Plantago.	Scutellaria galericulata.
Galium palustre.	Epilobium hirsutum.	Prunella vulgaris.
— verum.	— parviflorum.	Rhinanthus Crista galli.
— aparine.	— tetragonum.	Pedicularis palustris.
Plantago major.	Polygonum Persicaria.	Antirrhinum Cymbalaria.
— lanceolata.	— Hydropiper.	— Oronium.
Parietaria officinalis.	— lapathifolium.	Scrophularia aquatica.
Potamogeton crispum.	— Bistorta.	Thlaspi Bursa pastoris.
— perfoliatum.	— aviculare.	Cochlearia Armoracia.
Sagina procumbens.	— Convolvulus.	Senebiera Coronopus.
Myosotis palustris.	Butomus umbellatus.	Cardamine pratensis.
Lithospermum arvense.	Saxifraga granulata.	Nasturtium officinale.
Symphytum officinale.	— tridactylites.	— sylvestre.
Hottonia palustris.	Silene inflata.	— terrestre.
Lysimachia vulgaris.	Stellaria media.	— Irio.
Anagallis arvensis.	— holostea.	— Sophia.
Convolvulus arvensis.	Arenaria serpyllifolia.	Barbarea vulgaris.
— sepium.	— rubra.	Erysimum Alliaria.
Campanula rotundifolia.	Sedum acre.	Brassica campestris.
Solanum Dulcamara.	— reflexum.	Sinapis arvensis.
— nigrum.	Agrostema Githago.	Raphanus Raphanistrum.
Chenopodium Bonus Hen-	Lychnis Flos Cuculi.	Erodium cicutarium.
ricus.	— dioica.	Geranium pyrenaicum.
— urbicum.	Cerastium vulgatum.	— molle.
— rubrum.	— semidecandrum.	— dissectum.
— hybridum.	— aquaticum.	Malva sylvestris.
— album.	Spergula arvensis.	Fumaria officinalis.
Ulmus campestris.	— nodosa.	Lathyrus pratensis.
Torilis infesta.	Mespilus Oxyacantha.	— repens.
Scandix Pecten-Veneris.	Spiræa ulmaria.	— arvense.
— anthriscus.	Rosa canina.	— procumbens.

rally smooth, and of a dark green colour, but in dry situations it becomes hoary, as well as more dwarf in stature. The leaves are mostly opposite, sessile, lanceolate, pointed, entire, and various in length, the upper ones diminishing to bracteas. The flowers terminate the stem in numerous axillary whorls, six in each, of a bright crimson, or purple colour, forming long, leafy spikes of great beauty and elegance, but without smell. The calyx is inferior, cylindrical, striated, downy, or hairy, with twelve marginal teeth, six of which are long, awl-shaped, erect, and reddish, the others minute, ovate, concave, and bent inwards. The petals are six, elliptic-oblong, equal, wavy, and of a variable crimson, or purple colour. The filaments are twelve, thread-shaped, the six alternate ones shortest, all inflected while young, and bearing roundish anthers. The germen is ovate-oblong, with a simple style, and capitate stigma. The capsule is small, elliptical, 2-celled, and inclosed in the tube of the calyx. Fig. (a) represents a flower cut open; (b) the calyx; (c) the same cut open; (d) the germen and style; (e) a seed.

QUALITIES.—The dried herb is inodorous, and has an herbaceous, sub-astringent taste. Its active matter is dissolved equally by water and alcohol; hence it appears to consist of extractive matter, with a small portion of tannin, as it strikes a black colour with the sulphate of iron.

Lathyrus filiforme.
Medicago lupulina.
Picris echioides.
Sonchus arvensis.
—— oleraceus.
Leontodon Taraxacum.
Hieracium pilosella.
Lapsana communis.
Cichorium Intybus.
Arctium Lappa.
Cnicus lanceolatus.
Carduus acanthoides.
Bidens cernua.
—— tripartita.
Artemisia vulgaris.
—— Absinthium.
Tussilago Farfara.
—— Petasites.
Senecio vulgaris.
—— aquaticus.
Bellis perennis.

Chrysanthemum Leucanthemum.
—— segetum.
Pyrethrum Parthenium.
—— inodorum.
Matricaria Chamomilla.
Anthemis Cotula.
Achillea Ptarmica.
—— Millefolium.
Centaurea nigra.
—— Cyanus.
—— Scabiosa.
Orchis mascula.
Zanichellia palustris.
Euphorbia helioscopia.
—— Peplus.
Sparganium nodosum.
—— simplex.
—— ramosum.
Carex vulpina.
—— flava.

Carex paludosa.
—— riparia.
—— vesicaria.
Urtica urens.
—— dioica.
Amaranthus Blitum.
Bryonia dioica.
Sagittaria sagittifolia.
Arum maculatum.
Salix fragilis.
—— alba.
—— carulea.
—— triandra.
—— amygdalina.
—— viminalis.
Humulus lupulus.
Mercurialis perennis.
—— annua.
Hydrocharis Morsus ranae.
Atriplex angustifolia.
—— erecta.

MEDICAL PROPERTIES AND USES.—Loosestrife is astringent and tonic, and has been recommended by De Haen, and several other continental physicians, as a remedy in intermittent fever, chronic dysentery, and diarrhœa. Though it has long been celebrated in Ireland, it is seldom prescribed in regular practice. It has been given generally in the form of a decoction, made by boiling one ounce of the dried herb in a pint of water, down to half a pint. Of this the dose may be three or four ounces twice a day.

shorter than the leaves, are numerous, small, of a pale pink colour, accompanied with minute bracteas. The calyx is monophyllous, 5-toothed and downy; the corolla consists of five oblong, spreading petals, downy on the outside, and considerably larger than the stamens. The nectary is a fleshy, crenate ring, surrounding the lower two-thirds of the germen. The filaments are ten, alternately shorter, inserted on the exterior margin of the nectary, and supporting oblong anthers. The germen is superior, ovate, with a cylindrical style, and 3-lobed stigma. The capsule is oblong, triangular, smooth, 3-celled and 3-valved, each cell containing a single seed, which is broad-cordate at the base, deeply emarginate, with a long and slender point. Fig. (a) represents a flower somewhat magnified; (b) the capsule; (c) a transverse section of the same; (d) the seed.

Olibanum is chiefly collected in India; but it is also imported in casks and chests from the Levant. It distils from incisions made in the bark of the tree, during the summer months. It is the frankincense of the ancients, the *thus* of the Romans, and the *Λιβανος* of Theophrastus and Dioscorides. The latter writer mentions it as procured from India; and Theophrastus, Hist. Pl. lib. ix. c. 4, says *Γίνεται μὲν οὖν ὁ λιβανός ἐν τῇ τῶν Ἀραβῶν χώρα μὲση περὶ τοῦ Σαβὰ καὶ Ἀδραμίττα, καὶ Κίραβαίνα*. The same observation is made by Strabo, l. xvi. p. 778; Plin. Nat. Hist. lib. vi. c. 28; and Virgil, Geor. i. v. 58.

QUALITIES.—Olibanum is in the form of semi-transparent masses or tears, of a pale yellowish, or pink colour, solid, hard, and brittle. It has a bitterish acrid taste, and when chewed, sticks to the teeth, and renders the saliva milky. When heated, it burns brilliantly, and diffuses an agreeable odour. Alcohol dissolves three-fourths of it, and water about three-eighths. On distillation alone, it affords a yellowish, fragrant, essential oil. From the analysis of Braconnot, it appears, that in 100 parts Olibanum is composed of 8 essential oil, 56 of resin, 30 of gum, and 5.2 of a matter resembling gum, but insoluble in water and alcohol.*

MEDICAL PROPERTIES AND USES.—The virtues of Olibanum are merely those of a stimulant and diaphoretic. It was formerly much used as a remedy in various diseases of the head and chest, in vomitings, diarrhoea and dysentery; and externally, as a vulnerary. Riverius recommends it in pleurisies; and Geoffroy professes to have experienced its success in those diseases, especially after venesection. The dose was from ʒj to 3j. At the present day it is seldom employed, except as a perfume in the rooms of the sick, and is scarcely entitled to a place in the *materia medica*.

In the early ages, it was much used as incense in sacrifices; and in modern times, the Greek and Romish churches still retain the use of frankincense in some of their ceremonies.



SACCHARUM OFFICINARUM.

Common Sugar-cane.

Class III. TRIANDRIA.—Order II. DIGYNIA.

Nat Ord. GRAMINA, Lin. GRAMINEÆ, De Cand.

GEN. CHAR. *Calyx* 2-valved, 2-flowered, enveloped in long wool. *Lower floret* neuter with one *palea*, upper hermaphrodite with two *paleæ*, the upper of which is very small or obsolete.

SPEC. CHAR. *Leaves* flat, entire, smooth. *Panicle* loose, with long, simple, slightly zigzag, verticillated spikes. *Calyx* lanceolate, naked, except at the base.

Syn.—*Arundo saccharifera*. Bauh. Pin. p. 18; Park. p. 1210; Raii Hist. 1278; Sloane Jam. v. 1. p. 108. t. 66; Rumph. Amb. v. 1. p. 186. t. 74. f. 1. Hughes Barbadoes, p. 244. t. 23. f. 1.

Saccharum officinarum. Lin. Sp. Pl. 79; Willd. v. 1. p. 381; Humb. et Kunth Nov. Gen. v. 1. p. 146; Spreng. Syst. Veget. v. 1. p. 281; Tussac Fl. des Antilles, v. 1. p. 151. t. 23; Hook. Bot. Miscell. part 2. p. 95. t. 26.

FOREIGN.—*Canna à sucre*, Fr.; *Cana de Azucar*, Sp.; *Cana de Assucar*, Port.; *Zukkerrohr*, Ger.; *Sukkerør*, Dan.; *Sokerror*, Swed.; *Can che*, Chin.; *Kaansia*, Jap.; *Viba*, Bras.

THE Sugar-cane, which is supposed to be a native of the East Indies, though now introduced into the tropical parts of the western continent, and the West India islands, is one of the most valuable in a commercial point of view, as well as most beautiful productions of the vegetable kingdom. The Chinese date the cultivation of this precious plant from periods of the most remote antiquity: but Dr. Roxburgh ascertained that the sugar-cane of China was different from the *S. officinarum*, and he has published it as the *S. sinense*. That the sugar-cane is indigenous to the south-eastern parts of Asia, we have the strongest reason to believe, for Marco Polo, a noble Venetian, who travelled in the East, about the year 1250, found sugar in abundance in Bengal. Vasco de Gama, who doubled the Cape of Good Hope in 1497, relates that a considerable trade in sugar was then

carried on in Calicut. From the East Indies, the sugar-cane was carried, towards the close of the thirteenth century, to Arabia, whence the cultivation of it soon extended to Nubia, Egypt, and Æthiopia. Mr. Bruce found it in Upper Egypt; and John Lioni says, that a considerable trade was carried on in sugar in Nubia, in 1500; it abounded also at Thebes, on the banks of the Nile, and in the northern parts of Africa about the same period. From Africa it migrated into Italy, and the Moors introduced it into Spain. In Spain, the sugar-cane was first planted in Valencia, and afterwards in Granada and Murcia. From these provinces the culture and manufacture of sugar was carried by the Spaniards to the Canary islands, in the fifteenth century. But prior to that period, the Portuguese in 1420 carried it from Sicily to the island of Madeira. In 1506, according to Antonio Herrera, the sugar-cane was conveyed by the Spaniards to St. Domingo, and thence extended to the West India islands, and the Brazils; in the former of which it now forms one of the staple articles of trade. An interesting account of the natural history of the sugar-cane, with remarks on its cultivation, may be found in the second number of Dr. Hooker's "Botanical Miscellany," written by Dr. Macfayden, of Jamaica.

The root of the sugar-cane is perennial, jointed, solid, and fibrous; sending up several simple, erect, round, smooth, leafy, jointed stems, to the height of ten or twelve feet. At each articulation of the stem is a double or triple row of deep greenish punctures. The leaves are three or four feet long, and three inches broad, linear-lanceolate, and arise singly from the joints, embracing the stem at the base to the next joint above their insertion: they are smooth, spreading, entire, flat; with the midrib prominent on the under side, the edges sharply toothed, and ciliated near the base with rigid white hairs. The flowers are small, and produced in a terminal loose panicle, about two feet in length, composed of numerous subdivided whorled spikes, with long flexuose down which conceals the flowers, and gives to the plant a very elegant appearance.* The flowers are all

* In the West Indies, the planters commonly assert that the sugar-cane never blossoms; their observations being made on plants cultivated in a most luxuriant soil, where they increase much by root, and are cut before they produce flowers.

hermaphrodite, and stand in pairs, at the joints of the smaller divisions of the panicle. The calyx is 2-flowered, consisting of two oblong-lanceolate, pointed, erect, concave, nearly equal beardless glumes, enveloped in long hairs from the base. The corolla is shorter than the calyx, and composed of two very minute, pellucid valves, the innermost very slender. The filaments are three, capillary, longer than the corolla, and bear oblong, yellowish anthers. The germen is ovate, bearing two styles, terminated by brownish feathery stigmas. Fig. (a) is intended to represent the entire plant reduced; (b) a flower magnified; (c) the same closed; (d) a portion of the panicle, with the flowers of the natural size.

It is a remarkable fact, that the sugar-cane in the West Indies never perfects its seeds; the plant being propagated always by cuttings from the roots. Dr. Roxburgh, who resided many years in India, never saw the seed of this plant.

The oldest stock of canes cultivated in the West India islands, is said to have been brought from Spain. "There cannot be a doubt indeed, says Dr. Macfayden, "but that the sugar-cane is not indigenous to any part of the New World. We are, it is true, informed by the early voyagers and travellers, that canes were found growing wild on the banks of the Mississippi, and other rivers of continental America; and Labat mentions that the first French settlers met with them in Martinique and some of the other islands. It is most probable that they mistook for them some other of the reedy grasses, such as the wild *Arundo sagittata*, or some species of the genus *Arundinaria*—all of which are common on the banks of rivers in these latitudes, and all, by their appearance and manner of flowering, might readily deceive an inexperienced eye. Besides, were the sugar-cane a native, it would be difficult to account for its being at present found nowhere in a state of nature."

There are several varieties of the common sugar-cane. Louriero mentions three sorts, differing in the culm, viz. the white sugar-cane, the red sugar-cane, and the elephantine sugar-cane. In Ceylon, there are three varieties, the common, white, and purple. In

the Mysore, two kinds of cane are chiefly cultivated, the *restali* and *putta putti*. In the West Indies, the oldest variety is commonly known by the name of the *Country Cane*. It is readily distinguished by its diminutive size, its spindling stem, approximate joints, and narrow grass-like leaves. The *Ribbon Cane* is a variety of inferior quality, and is known by its strong stem and distant joints, marked with longitudinal stripes of purple and yellow. The *Bourbon*, sometimes called the Otaheite Cane, which was first imported into the French islands of Guadaloupe and Martinique, surpass all other varieties in the thickness of its stem, and is very generally cultivated on account of the greater quantity of sugar which it affords. It is much taller, and yields one-third more sugar than the country-cane; but the sugar is not of such a compact grain. The *Violet Cane*, or as it is called in the French islands, the *Batavian Cane*, which has a purple-coloured stem and luxuriant foliage, has been considered by Roëmer and Schultes, as a distinct species, under the name of *S. violaceum*.

“The Cane,” remarks Dr. Macfayden, “requires a fertile soil. We have an example of a soil of this description in the parish of Vere, which, with all its disadvantages of climate, must ever rank, in proportion to its size, as the most productive sugar district in the island. On examination, it will be found to contain all the ingredients set down by Sir H. Davy as necessary to constitute a fertile soil. It is composed of alluvial matter, mixed with clay and sand, together with calcareous matter, washed down from the neighbouring hills. Plantain Garden River, on the other hand, which holds only a secondary rank as a sugar district, is composed principally of alluvial matter, mixed with clay and finely-divided gravel, there being very little traces of lime.”

Sugar was formerly manufactured in the southern parts of Europe, and from an extract given by Mr. Loudon, p. 111, of his “*Encyclopedia of Agriculture*,” from an Arabian writer, it appears that it has been cultivated upwards of seven hundred years in Spain, and probably two or three centuries more. At

present, almost the whole of our sugar is produced in the East and West Indies.

Besides our officinal plant, many others contain sugar, though not in such abundance. In North America, however, it is extracted from the *Acer saccharinum*, or Sugar Maple, but in too small quantities for exportation. During the last protracted war, when France had lost her colonies, sugar was manufactured at Bruges from white beet-root, and with such success, that when the produce of the West Indies sold for five shillings a pound, it could be produced on the spot from *mangold-wurzel*, at less than one shilling; and to such perfection had the process arrived, that the prefect, mayor, and some of the chief inhabitants of Bruges who were invited by a manufacturer to witness the result of his experiments, allowed the specimen which he produced to exceed those of the foreign sugar. Sugar has also been prepared from grapes, from the carrot, and from various other fruits and roots: it is formed largely during malting; and starch may easily be converted into sugar by digesting it in dilute sulphuric acid. Sugar may likewise be regarded as an animal product, for it exists in very notable proportions in milk, and is found in considerable quantity in patients labouring under diabetes.

The method of making sugar from the juice of the common sugar-cane in Hindostan is exceedingly simple, and requires little or no expensive apparatus; while to the philanthropist it is doubly sweet, being produced by the efforts of free agents, whose backs are never scored with whips, and who return after the labour of the day to their domestic fire-sides, in the happy enjoyment of liberty. The soil chosen is a rich vegetable mould, so situated as to be easily watered from a river. About the end of May, when the soil is reduced to soft mud, either by rain or artificial watering, slips of the cane, containing one or two joints, are placed in rows about four feet from row to row, and eighteen inches asunder in the rows. When they are grown to the height of two or three inches, the earth around them is loosened. In August small trenches are cut through the field to drain off the rain, if the season prove

too rainy, and to water the plants if the season be too dry. From three to six canes spring from each slip that is set. When they are about three feet high, the lower leaves of each cane are carefully wrapped round it ; and then the whole belonging to each slip are tied to a strong bamboo eight or ten feet high, and stuck into the earth in the middle of them. They are cut in January and February, about nine months after the time of planting them. They have now reached the height of eight or ten feet, and the naked cane is from an inch to an inch and a quarter in diameter. They have not flowered, otherwise, when this happens, the juice loses much of its sweetness. The newly cut canes are put through the rollers of a mill, and the juice collected into large iron boilers, where it is boiled down smartly to a proper consistence, the scum being carefully taken off. The fire is then withdrawn, and the liquid by cooling becomes thick. It is then stirred about with sticks till it begins to take the form of sugar, when it is put in mats made of the leaves of the *Borassus flabelliformis*, and the stirring is continued till cold. This process yields a *raw* or *powdered* sugar ; but it is clammy, and apt to attract moisture from the atmosphere, because the acids in the juice have not been removed. By the addition of quick lime to the juice in the proportion of about three spoonsful to every fourteen gallons, the sugar loses this property. From an acre of ground about five thousand pounds of sugar are obtained.

In the West India islands the raising of sugar is much more expensive, and the produce much less, owing to the high price of labour ; or, which is the same thing, to the nature of the labourers, and to the inferiority of the soil. The ground being cleared and worked a foot or more in depth, the sets or cuttings of cane are planted in rows, generally five feet distant, and from two to five feet apart in the row, according to the quantity of the soil ; more plants being allowed for a poor than a rich one. The ground is kept clear from weeds, is frequently stirred and some earth drawn up to the plants. Cane plantations are made twice a year, in May and June, or December and January ; these being the rainy seasons. The first cutting of the cane does not

take place till a year after planting; but an established plantation is cut every six months. In good soil, the plants will last twenty years; in inferior soils not more than half that time.

The sugar-cane is propagated by cuttings of the stalk, taken near the top, and laid horizontally in the ground. In Jamaica and the other West India islands, the canes are usually cut for the purpose of making sugar, immediately after the autumnal rains, when the plant has acquired from eight to twelve feet in height. The arrowing of the cane is a sign of its attaining its full growth; and it is desirable, that it should be cut as early after this as possible. As soon as they are cut, the canes are stripped of their leaves and crushed between iron cylinders, to express the juice, which is received into a large copper vessel, called the *clarifier*, where it is mixed with lime, in the proportion of one pint to 100 gallons of juice, and heated to the temperature of 140°. A thick scum soon collects on the surface, which is left unbroken, and the clear liquor is drawn from below, and introduced into a large boiler. Here it is boiled briskly, till the bulk of the liquor is considerably diminished, the scum as it forms being constantly removed. From this first boiler it is passed into a second, from that to a third and fourth, in each of which the boiling is continued. When sufficiently concentrated, it is poured into a large wooden vessel called the *cooler*, where it crystallizes or *grains* as it cools. The mass is then put into empty hogsheads, having a hole in the bottom, into which the stalk of a plantain leaf is thrust. Through these holes the *molasses* drain into a receiver, and the sugar thus cleared is brought to this country under the name of *muscovado* or *raw sugar*. The thick black syrup which remains mixed with it, well known by the name of *molasses*, is usually separated by draining. A gallon of raw juice yields on an average about a pound of raw sugar.

The raw sugar imported into Europe is still farther purified. It is dissolved in lime-water, and boiled along with a small quantity of blood. The lime abstracts any portion of acid that may still remain, and the blood coagulates and entangles all the

impurities, which are thus easily removed, by scumming the liquor as they rise to the top. When the liquor is boiled down to a proper consistence, it is poured into inverted conical moulds made of clay, where it consolidates, and any syrup which may remain is removed by allowing a little water to drain through it. The sugar-loaf is then thoroughly dried in an oven. The sugar thus purified is called *loaf-sugar*. When redissolved and heated the same way a second time, it is called *refined sugar*. This process is said to have been first practised by the Venetians.

In the East Indies, where they make a very fine sugar, their process is simple and economical, but tedious. An account of the process, written by Mr. Anderson, may be found in the Philosophical Magazine, v. xxi. p. 272.

In North America, the farmers procure sugar for their own use, by boring the trunk of the *Acer saccharinum*, before referred to. It reaches maturity in about twenty years, and is then from two to three feet in diameter. In February, March, and April, the operation is performed with an auger to the depth of about three fourths of an inch, and in an ascending direction. The hole is then deepened to two inches. A wooden spout is introduced into it to direct the juice as it flows. The sap flows from four to six weeks. When it ceases on the south side, the north side is bored. This process instead of injuring the tree improves it. An ordinary tree yields, in good seasons, from twenty to thirty gallons of sap, from which are made from five to six pounds of sugar. After being strained through a cloth, it is put into large flat kettles, usually mixed with quick lime, white of egg, and new milk. A spoonful of slacked lime is sufficient for fifteen gallons of sap; a little butter is added to prevent it from boiling over. When boiled down sufficiently, it is allowed to *grain*, or form small crystals, which constitute raw sugar.

QUALITIES AND CHEMICAL PROPERTIES.—Sugar procured pure by the preceding methods, has a strong sweet taste, but no smell. Its colour is white, and when crystallized, it is somewhat transparent. It has often a considerable degree of hardness; but it is always brittle, so as easily to be reduced to powder. When two pieces are rubbed together in

the dark, a green phosphorescent light is visible. Sugar is soluble in its own weight of cold water, and in a very small quantity of boiling water, forming a solution commonly called syrup. Sugar is likewise soluble in alcohol, and the solution affords crystals on evaporation; the form of the crystals is a four or six-sided prism, bevelled at each extremity, or sometimes acuminate by three planes. The specific gravity of sugar, according to Thompson, is 1.5629. Neither oxygen, azotic gas, nor the metals, have any sensible action on it. The sulphuric and muriatic acids decompose it, and form a black precipitate; nitric acid dissolves it and converts it into oxalic acid: many of the vegetable acids prevent it in a great measure from crystallizing. When lime is added to a solution of sugar, and the mixture boiled for some time, a combination takes place; the liquor retains its sweet taste, but acquires also a bitter and astringent one, and the sugar is disengaged, unchanged by the mineral acids. Sugar facilitates and increases the solubility of lime and strontian, and forms combinations with them. The fixed alkalis combine with sugar, and form compounds not unlike those which have just been described. Oils readily combine with sugar, and the mixture is miscible with water. The hydrosulphurets, sulphurets, and phosphurets of alkalies and alkaline earths decompose sugar, and convert it into a substance bearing a great resemblance to gum. When it is exposed to heat it melts, swells, and becomes brownish-black, emits air bubbles, and exhales a peculiar odour, known in French by the name *caromel*. At a red heat it bursts into flame, with a kind of explosion; it is completely decomposed; acetic and carbonic acids, carburetted hydrogen, and an empyreumatic oil, are disengaged, while a carbonaceous substance remains. When sugar is boiled with several of the metallic oxides, it reduces them to a lower state of oxidation; it also decomposes some of the metallic salts. The ultimate constituents of sugar, according to Gay Lussac, Thenard, and Berzelius, are as follow:—

	Gay Lussac and Thenard.			Berzelius.			
Oxygen	50.63	..	51.47	..	49.015	..	49.083
Carbon	42.47	..	41.48	..	44.200	..	44.115
Hydrogen	6.90	..	7.05	..	6.785	..	6.802
	<hr/>			<hr/>			
	100		100		100		100

MEDICAL PROPERTIES AND USES.—Sugar was known to the ancients, but was not used among them as it is at the present day with us. Paulus of Ægina, one of the last Greek writers, who flourished about the middle of the sixth century, is the first author who expressly mentions it.

It was originally called *mel arundinaceum*, viz. reed or cane honey. Lucan, enumerating the eastern auxiliaries of Pompey, describes a people who used the juice of the sugar-cane as a common drink :

“ Qui bibunt tenerâ dulces ab arundine succos.”

The fresh juice of the sugar-cane is extremely nutritious, antiseptic, and laxative. Raw sugar and molasses coincide in medical and alimentary properties with the expressed juice of the cane; and refined sugar externally applied, is escharotic. In moderate quantities sugar is a wholesome condiment, and it has been observed that the slaves in the West Indies, when abundantly supplied with it, become fat and vigorous during the sugar harvest. When taken in excess, however, it is extremely apt to disagree with the stomach, producing nausea, loathing, thirst, diarrhoea, and general disorder of the primæ viæ. By some it has been asserted, that sugar is injurious to the teeth; but many instances are on record of persons who have indulged largely in the use of this luxury without experiencing any inconvenience from it in that respect. Dr. Rush affirms that the plentiful use of sugar is one of the best preventives against worms. It is also beneficial in scurvy and some chronic diseases of the skin; but its too liberal use is contraindicated in calculous disorders, and in hypochondriacal and dyspeptic habits. Sugar taken in large quantities both in a solid and soluble form, acts chemically on verdigris, while it increases the action of the bowels; it is, therefore, a valuable antidote to that violent poison. Externally it is sometimes applied to fungous ulcers. It has the property of preserving a number of animal and vegetable substances from decay or putrefaction, and is commonly employed for those purposes. To it we are indebted for the base of our conserves, and our medicated syrups form a useful appendage to the surgery.

OFF. PREP.—Syrupi omnes, *L.E.D.* Trochisci omnes, *E.* Confectiones omnes, *L.*



BONPLANDIA TRIFOLIATA.

Three-leaved Bonplandia.

Class V. PENTANDRIA.—Order I. MONOGYNIA.

Nat. Ord. QUASSIÆ, Juss. RUTACEÆ, De Cand.

GEN. CHAR. *Calyx* monophyllous, bell-shaped, 5-toothed. *Corolla* of 5 petals, cohering near the base, funnel-shaped. *Nectaries* 5, covering the germen.

Syn.—*Cusparia febrifuga. Humboldt, Géogr. des Plantes.*

Bonplandia Angostura. Rich. Mém. de l'Institut. an. 1811. p. 82. t. 10.

Bonplandia à trois Feuilles. Roq. Phytogr. Medic. v. 2. t. 143.

Galipea officinalis. Hancock in Trans. of Med. Bot. Soc. v. 1. t. 2. ?

Bonplandia trifoliata. Willd. Act. Berol. an. 1802, p. 24; Humboldt et Bonpl. Pl. Equinoct. v. 2. p. 59. t. 97.

FOREIGN. *Angusture, Fr.; Angustura, It.; Angustararinde, Ger.*

THIS tree, which affords the bark known in the Pharmacopœias under the name of *Angustura* or *Cusparia*, is a native of South America, growing abundantly in the woods, near the eastern bank of the Carony, at the foot of the hills that surround the missions of Capassui, Upata, and Alta Græcia. It also grows in the neighbourhood of Santa Fee de Cumana and Neuva Barcelona; and was called *Angustura* because it came from Neuva Guyana, or *Angostura*. The bark was originally brought from St. Domingo, about the year 1778, and was supposed to be derived from a tree indigenous to Africa, or to the Spanish West Indies; but this account appears to be incorrect, and MM. Humboldt and Bonpland have discovered it to be the produce of a tree not previously known, of Jussieu's natural order of the Quassiæ, to which Willdenow has given the name of *Bonplandia*, in honour of Baron Humboldt's companion. This name was subsequently adopted by Humboldt and Bonpland, in their splendid work on Equinoctial plants, though the former had

Brucea ferruginea, a common tree in Abyssinia: this however is not true, as instead of coming from the neighbourhood of the Red Sea, it is brought from South America. In consequence of its yielding *strychnine*, besides a new alkali called *brucine*, it has been conjectured to be one of the *Strychnos* family; and with less probability perhaps, though a more recent opinion, it has been thought to be yielded by the *Solanum pseudo-quina* or *Quina do campo* of the Brazilians. The peculiarities of the two barks are also contrasted in the subjoined table:—

TRUE ANGUSTURA.	FALSE ANGUSTURA.
Smell, strong and disagreeable.	Smell, none.
Taste, bitter, not lasting.	Taste, insupportably bitter, and very lasting.
Epidermis, covered with lichens.	Epidermis, almost entirely free from lichens.
Put into water it soon becomes dry, and imbibes it readily.	Put into water it still remains hard.
Fragile when dry.	Exceedingly hard and difficult to break.
Very light, and of rather a spongy texture.	Very heavy, and of a compact texture.
Fracture, resinous and brilliant.	Fracture, unpolished and somewhat black.
Internally of a yellowish-brown colour, and capable of being detached in laminae.	Internally nearly black, smooth, and not to be detached in laminae.
Easily acted on with sharp tools.	Cut with difficulty.

M. Orfila ranks the false *Angustura* bark amongst the most energetic of the vegetable poisons, and by referring to his system of Toxicology, it will be seen that his experiments with it on animals fully bear out the assertion. It acts like *nux vomica* and the other *strychnos*. For the methods of obtaining *brucine*, and for an account of its properties and action on the animal system we must refer our readers to a copious detail under ART. *Strychnos Nux-vomica*.

MEDICAL PROPERTIES AND USES.—True *Angustura* Bark is a valuable tonic, and has been considered more powerful in many diseases than the Peruvian bark, especially in simple debilities of the stomach and intestinal canal, in chronic diarrhæa, and in the last stages of dysentery. It was originally introduced as a remedy for intermittent fever; but its febrifuge virtues have been found, in this country at least, greatly inferior to that celebrated medicine. Dr. Hancock says, “I am fully convinced, from ample experience of the virtues of this bark, that it is one of the most valuable febrifuges we possess, being adapted to the worst and most malignant bilious fevers, while the fevers in which cinchona is chiefly administered, are simple intermittents, for the most part unattended with danger.” It is best given in powder, or infusion; of the former the dose may be from ʒj to ʒj.



Croton chloroxanthus

CROTON ELUTERIA.

Elutheria, or Cascarilla-Bark Tree.

SPEC. CHAR. *Leaves* ovate-acuminate, entire, smooth, silvery with orbicular scales beneath. *Racemes* axillary or terminal. *Stem* arborescent.

Syn.—Clutia Eluteria, foliis cordato-lanceolatis. *Lin. Sp. Pl.* 1476; *Amæn. Acad.* v. 5. p. 411.

Croton fruticosum erectum subvillosum, foliis cordatis acuminatis, spicis terminalibus. *Brown Jam.* 337.

Mali folio arbor artemisia: odore et flore. *Sloan. Hist.* v. 2. t. 174. f. 2.

Croton Eluteria. *Willd. Sp. Pl.* v. 4. p. 545; *Swartz Prodr.* 100; *Fl. Ind. Occid.* 2. p. 1183; *Stokes' Bot. Mat. Med.* v. 4. p. 444; *Woodv. Suppl.* p. 2. t. 211.

ALTHOUGH the London College has designated the plant which yields the Cascarilla bark, by the name of Croton *Cascarilla*, there is reason to believe that the tree or shrub to which this name was given by Linncus, does not furnish the bark that we use in medicine, but that it is obtained from the Clutia *Elutheria* of that author. It is the Croton *Elutheria* of Swartz and Willdenow; and Europe is supplied with the bark exclusively from the Bahama islands, where the plant grows in great abundance. It is also said to be a native of Jamaica, and grows in St. Domingo, in dry, stony places, about the Port de la Paix, from whence it is called *Sauge du Port de Pair*. “Among other circumstances,” says Dr. Woodville, to whose work we are indebted for the accompanying figure and description, “which tended to involve the parental source of Cascarilla long in uncertainty, was the assertion of some authors, that it was a native of the Spanish Main, and was thence imported into Europe: thus founding a presumption that the Cascarilla and Eleuteria barks were different, and the latter only was the pro-

duce of the Bahama islands.* But this assertion we have discovered to be contrary to fact; for upon inquiry we do not find that this drug was ever imported from Spanish America; but that the Bahamas have constantly supplied the European markets with Cascarilla bark, a parcel of which was sent here from one of those islands, along with specimens of the tree producing it; of which the figure here given is a faithful representation, as may be seen by comparing it with the original in the herbarium of Sir Joseph Banks. But it will be necessary to observe here, that Dr. Wright, in his account of the medicinal plants growing in Jamaica, gives the name *Croton Eleutheria* to a tree, the bark of which, he says, is the same as the Cascarilla or *Eleutheria* of the shops.”†

The *Eleutheria* is a small tree, seldom exceeding twenty feet in height, and sending off numerous branches especially towards the top; the bark which covers the branches is brown and smooth; but that of the trunk is externally more white and rough. The branches are brittle, and, when broken, ooze out a thick balsamic juice. The leaves are entire, ovate-lanceolate, somewhat cordate, and elongated towards the apex, which is blunt, and placed alternately on short petioles. The upper surface is studded with small orbicular scales; the under is whitish, shining and silvery. The flowers are in axillary and terminal spikes, and are composed of a calyx divided into five ovate leaflets, and an equal number of small whitish, oblong, obtuse petals. The male flower has ten awl-shaped filaments, bearing erect, compressed anthers. The female produces a roundish germen, supporting three bifid spreading styles, with obtuse stigmas. The capsule is oblong, marked with six furrows, and divided into three cells, each containing a solitary, oval, shining seed.

QUALITIES AND CHEMICAL PROPERTIES.—This bark is brought to us in chests and bales. It is either in curled pieces, or in short quills of a greyish colour on the outside, and a

* See Boulduc. *Hist. de l'Acad. des Scien. an.* 1719. p. 14. Spielman, *MM.* p. 249.

† See *Medical Journal*, v. 8. for 1787, p. 249.

brownish-red on the inner. It is covered with a great variety of lichens.* It has an aromatic agreeable odour, and when burnt emits a smell resembling that of musk. To the taste it is warm, bitter, and aromatic; and breaks with a resinous fracture. The powder is of a greyish brown colour. It yields its virtues partially to alcohol and to water; completely to proof spirit. According to an analysis of Trommsdorf, 4696 parts of it yielded,

Mucilage and bitter principle	. 864
Resin	. 688
Volatile oil	. 72
Water	. 48
Woody fibre	. 3024

4696

Ann. de Chim. xxij. 219.

MEDICAL PROPERTIES AND USES.—Cascarilla or Elutheria bark appears to have been first introduced into practice by J. And. Stisser, doctor in medicine, and professor in the university of Juliers, who, in his *Specimen Actor. Laboratorii Chymici*, published at Helmstadt in 1693, relates that he had some of it given him by a person of distinction, at that time just returned from England, who told him that it was then the custom in that country to mix it with tobacco, in order to render it more agreeable for smoking. It was afterwards sold in the public markets at Brunswick for Peruvian bark, and in his hands it proved carminative and diuretic, and was useful in arthritic and

* The subjoined enumeration is to be found in a work by M. Fée, entitled "L'essai des Cryptogames des écorces exotiques officinales."

Opegrapha abbreviata.	Fissurina lactea.	Pyrenula leucostoma.
Comma.	Arthonia divergens	endoleuca.
calcea.	polymorpha.	Porina americana.
heterocarpa.	dilatata.	Verrucaria epidermis.
myriocarpa.	Sarcographa tigrina.	planorhis.
Graphis exilis.	Cascarilla.	caduca.
tortuosa.	Chnoduleton paradoxum.	serialis.
pachnodes.	Trypethelium Sprengelii.	Gandichalta.
Cascarilla.	crassum.	Helotrema lepadium.
lineola.	lageniferum.	Coniocarpon myriadeum.
serpentina	Scoria.	Cascarilla.
caribaea.	porosum.	Lecidea arthonioides.
Afzelii	Parmentaria astroidea.	Parmelia perlata.
endocarpa	Pyrenula nitida.	
Glyphis favulosa.	pinguis.	

scorbutic cases. From an historical account of an epidemic fever of the intermittent form, accompanied with *petechiæ*, which raged at Nuremburgh, in the year 1694, the usual remedies proving ineffectual, J. Ludovicus Apinus, a physician of Herspruch, was induced to add to them the powder of cascarilla, which not only proved successful, but also relieved the dysentery which succeeded the fever. He states further, that copious perspirations were produced, without reducing the patient's strength; the bowels were also kept open, and those who did not sweat had generally three or four alvine evacuations daily. Where menstrual or hæmorrhoidal fluxes had been suppressed at the beginning of the disorder, they generally reappeared on the use of this medicine.* In 1719 an epidemic dysentery raged in France,† which appears to have yielded more readily to cascarilla than to any other remedy; and it was observed to support the strength and promote appetite, when lowness of spirits and debility of stomach followed the complaint.

It was soon after much used all over Germany, as a substitute for Cinchona bark; and although its virtues were too highly extolled in that country, it is still employed with considerable success. In England its real merits are pretty well appreciated, being considered a useful, warm, aromatic bitter, and as such employed as an efficacious stomachic, for flatulent cholic, chronic dysentery, and the diarrhœa of acute fevers: and although we do not depend on it alone in ague, we often combine it with cinchona bark, by which the stomach is enabled to bear larger quantities of the latter than it otherwise would. By the late Dr. Underwood it was highly esteemed as a remedy for the gangrenous thrush which sometimes affects children.

DOSE.—From ten to thirty grains of the powder three or four times a day.

OFF. PREP.—Infusum Cascarillæ, L.
Tinctura Cascarillæ, L.D.
Extractum Cascarillæ, D.

* *Historica relatio febris epidemicæ*, 1697.

† *Hist. de l'Acad. Royale des Sciences*, 1719.



Quercus pedunculata

CLI

QUERCUS ROBUR.

Common British Oak.

Class XXI. MONÆCIA.—Order VII. POLYANDRIA.

Nat. Ord. AMENTACEÆ, Lin. 50. Juss. 99. De Cand. QUERCINEÆ, Burn.

GEN. CHAR. Male flowers in a *catkin*. *Calyx* in several segments. *Corolla* none. *Stamens* 5 to 10.

Female. *Calyx* double; *outer* inferior, scaly, undivided; *inner* superior, in 6 deep segments. *Corolla* 0. *Style* 1. *Nut* coriaceous, surrounded at the base with the persistent outer calyx.

Syn.—*Quercus latifolia, Raii, Syn. 440.*

Quercus vulgaris, Ger. Em. 1339. 1340. f. f.

Quercus cum longo pediculo, Bauh. Pin. 420; Duham. Arb. v. 2. 202. t. 47.

Quercus, Trag. Hist. 1102. f.; Fuchs. Hist. 229. f.; Math. Vulgr. v. 1. 184. f. Camer. Epit. 111. f.

Quercus pedunculata, Willd. Sp. Pl. v. 4. 450.; Aut. Hort. Kew. v. 5. 294; Ehrh. Pl. Off. 168.

Quercus Robur, Lin. Sp. Pl. 1414; Fl. Brit. 1026; Eng. Bot. v. 19. t. 1312. Hook. Scot. 373; Mart. Rust. t. 10; Wood. t. 126.

FOREIGN.—*Chêne à Grappe, Fr.; Quercia, Rovera., It.; Roble; Carballo, Sp.; Carvalho, Port.; Gemeine Eich, Ger.; Feg. Dan.; Ek. Swed., Dub., Quercetum Dubrowa, Rus.; Dab, Pol.; Mesche, Turk.; Pélut, Pers.; Kara Nugi, Jap.*

OF this genus, so valuable for its economical uses, there are only fourteen species described by Linneus. The discoveries of Thunberg, Humboldt, and other distinguished travellers, have so greatly enriched the subject, during the last fifty years, that Willdenow, who wrote in 1805, describes seventy-six, and Persoon, about the same period, enumerates eighty-two species. Twenty-six species were discovered in North America, by two indefatigable naturalists, father and son, named Michaux; and Humboldt and Bonpland have mentioned twenty-four others, which they found in the course of their travels in South America. Of the one hundred and forty species known at the present day,

more than one half belong to America. The various species of oak are mostly large trees ; some are evergreens, and others are deciduous, or lose their leaves during the winter. In this country we have two distinct species of oak, the *Quercus Robur*, and the *Quercus sessiliflora* ; the former of which affords the best timber, and is by far the most common in the woods and hedges of Britain ; flowering in April.

The British Oak, it is well known, is a majestic forest tree, distinguished above all others for the slowness of its growth, its great size, longevity, and use. In woods, as Professor Martyn justly observes, it rises to a considerable height ; but singly, it is rather a spreading tree, sending off horizontally immense branches, which are much divided, more or less wavy, and covered with a rough brown bark. The leaves are deciduous, alternate, nearly sessile, or on very short footstalks, obovate, oblong, smooth, irregularly sinuated, with obtuse, rounded, entire marginal lobes ; their upper surface of a rich shining green, paler, and slightly glaucous underneath. The *male* or barren flowers are in numerous, pendulous, stalked, yellowish, downy catkins, two inches long, from scaly buds ; the *female* on axillary, simple stalks, few, scattered, sessile, small, and greenish tinged with brown. The calyx of the male flower is a scale of one leaf, bell-shaped, and generally five-cleft ; that of the female is double ; the outer one coriaceous, entire, becoming subsequently enlarged, and constituting the hard, tubercled, woody cup of the nut or acorn ; the inner of one leaf and divided into six pointed, downy segments, closely surrounding the base of the germen. The filaments are about ten, longer than the calyx, and supporting roundish 2-lobed anthers. The germen is ovate, crowned with a short conical style, and three obtuse recurved stigmas. The fruit is an oval, coriaceous, smooth nut, fixed to the inside of the outer calyx, as in a shallow cup, and dropping from it when the nut ripens in autumn. Fig. (*a*) represents a sprig with the male catkins ; (*b*) the same with the female flowers ; (*c*) a male flower magnified ; (*d*) a female flower magnified ; (*e*) the nut or acorn ; (*f*) the same divided longitudinally.

The knotty Oak of England, the "unwedgeable and gnarled oak," as Shakspeare called it, affords the strongest and most durable timber known. The oak timber imported from America, and that which is grown in the central parts of continental Europe, is greatly inferior to that of the true British Oak, especially in closeness of grain, hardness, and resistance of cleavage. It has, indeed, been supposed, that the inferiority of some of our more recently built ships, and the ravages which the dry-rot is making among them, have arisen from the substitution of foreign oak for that of native growth. It is a fact well known to botanists, but of which our planters and purveyors of timber appear to have no suspicion, that there are two distinct species of Oak in England, the *Quercus Robur*, and the *Q. sessiliflora*, the former of which affords a valuable wood, little liable to rot; the other a wood of inferior quality, very apt to decay, and not half so durable. It is therefore a subject of national importance to distinguish them, especially when the timber is to be applied to the purposes of naval architecture. The sessile-fruited Oak (*Mart. Rust. t. 12*) is less common than the species here figured, but it occurs frequently in the New Forest and other parts of Hampshire, in many parts of Norfolk, and about London. It may readily be discriminated from the British Oak, by having its petioles or acorn-stalks short and the leaf-stalks long; whereas the *Robur* has the acorn-stalks long, and the leaf-stalks short. Professor Martyn, who has given some interesting remarks on this subject, says, "The Durmast Oak differs very widely from the true British species, not only in the essential characteristics of the petioled leaves and sessile clustered acorns, but in several other remarkable circumstances. The whole tree has much the air of the chesnut, and is of a freer growth than the true Oak; the bark is of a lighter colour and smoother, the wood not so strong or of so firm a texture; the leaves are rather serrate than sinuate about the edge, with five, six, or seven sharp indentures on each side; whereas in the common oak there are only three or four, forming wide sinuses, blunt at the end; they are of a yellow green on the upper side, and a pale green on the under. In the specimens which we received in October, the under surface was of a hoary grey colour, with the ribs inclining to purple; an appearance which the leaves of the Common Oak never put on. These, together with the flowers and fruit, are said to appear later in the season than those of the first sort; and the leaves continue longer on the trees, sometimes the whole winter. Now if it should appear from experience," continues the learned Professor, "that the characters here delivered are permanent; and that Oak trees which bear sessile leaves, with the acorns or fruit-stalks, are of a superior quality as to their timber, to those which have the leaves or foot-stalks with sessile fruits; then we shall have an easy clue to direct us in our choice of trees for planting: for although it will be many years before the trees will be known by their fruit, yet they may from the first be distinguished by their leaves; and when planters become better acquainted with them, they will see the difference immediately by their air and habit."

With respect to age, the Oak exceeds any other tree, except perhaps the yew; even the timber is useless for purposes of art till it has grown

from fifty to seventy years. The age to which it can continue to vegetate has commonly been estimated at three hundred years; but tradition carries some trees which have escaped the axe to a period much more remote. In the New Forest, Evelyn counted, in the sections of some trees, three or four hundred concentric rings or layers of wood, each of which is supposed to record a year's growth. Not many years ago, the oak in Torwood Forest, in Stirlingshire, supposed to be the largest tree in Scotland, under the shadow of which Sir William Wallace used to assemble his army to oppose the tyranny of Edward, is said to have been still standing. Mr. Gilpin, in his work on Forest Scenery, speaks of a "few venerable oaks in the New Forest, that chronicle upon their furrowed trunks ages before the Conquest."

The oak attains a very great size, and, when it stands alone, specimens are sometimes met with whose trunks exceed forty feet in circumference. An oak, figured in the second edition of Evelyn's *Silva*, was felled at Withy Park, Shropshire, in 1697, which was nine feet in diameter, without the bark; there were twenty-eight tons of timber in the body alone; and the spread of the top, from bough to bough, was one hundred and forty four feet. The Greendale Oak, in Welbeck Park, is supposed to be about seven hundred years old; and measures thirty-five feet three inches in circumference near the base. The Framlingham Oak, (Suffolk,) used in the construction of the Royal Sovereign, was four feet nine inches square, and yielded four square beams, each forty-four feet in length. Dr. Plott mentions an oak at Norbury, which was of the enormous circumference of forty-five feet; and the same author mentions another at Keicot, under the shade of which four thousand three hundred and seventy-four men had sufficient room to stand. The Boddington Oak, in the vale of Gloucester, in 1783, was fifty-four feet in circumference at the base; and the hollow cavity was sixteen feet in its largest diameter, with the top formed into a regular dome. The Fairlop Oak, in Hainault Forest, in Essex, though inferior in dimensions to the last mentioned, was a tree of immense size; the tradition of the county traces it half way up the Christian æra. A few years ago its branches overspread an area of nearly three hundred feet; it is now entirely destroyed, but it is still customary, on the first Friday in July, to hold a fair on the spot where it formerly stood. Dammory's Oak, in Dorsetshire, was the largest oak of which mention is made. Its circumference was sixty-eight feet; and the cavity of it, which was sixteen feet long and twenty feet high, was, about the time of the Commonwealth, used by an old man for the entertainment of travellers. The dreadful storm in the third year of the last century shattered this majestic tree; and in 1755, the last vestiges of it were sold as firewood. On the north-west prospect of Whinfield Forest, near Appleby, in Westmoreland, stood an oak, not many years ago, called the "Three-brethren tree," whose circumference was forty-two feet near the base; and we are informed that in Lowther woods, in the same county, there are oaks of still greater dimensions.

From Domesday Book, it appears that in the time of William the Conqueror the Oak was chiefly prized for its acorns, and the value of the woods in several places is ascertained by the number of hogs they would fatten. During the time when the Saxons held sway in this country, the fattening of hogs upon acorns was accounted so important a branch of

domestic economy, that, about the close of the seventh century. King Ina enacted the *panage laws* for its regulation. It is not recorded that acorns were ever used as human food in this country, but they are still said to be so used by the poorer peasants in the south of Europe. Pliny informs us, that in his time acorns were brought to table in Spain for the dessert; and Cervantes, in his romance of Don Quixote, not only sets them before the goatherds as a dainty, but picks out the choicest for the countess herself. The oaks with edible acorns are not however of the same species as the British Oak. The Italian Oak, which Virgil represents as the monarch of the forest, and of which he has given such a splendid description in his second book of his Georgics, bore fruit which was used as food. The *Quercus ilex*, the common Evergreen Oak, or Holm Oak, which occurs in various parts of the south of Europe, and north of Africa, bears fruit, which in its flavour is said to resemble that of our sweet chesnut. There is another large handsome evergreen Oak, *Quercus Ballota*, or sweet-acorn Oak, a native of Barbary and Spain, of which the acorns are eatable and very palatable, either raw or roasted. During the late war in Spain, the French armies were very fortunate in finding subsistence upon the ballota acorns, in the woods of Salamanca. The *Quercus castanea*, the yellow Oak, which is found in all the fertile countries to the west of the Allegany mountains, and on the banks of the Delaware, yields abundance of acorns, which are sweet, and very palatable. Another American species *Q. bicolor*, or swamp white Oak, also produces acorns, which are sweet and edible, like those of the *ballota*, *Prinus*, *cuspidata*, *Esculus*, and several others.

QUALITIES AND CHEMICAL PROPERTIES.—Oak bark has no smell, but a rough astringent taste, which it yields to alcohol and water. The infusion contains both gallic acid and tannin, the latter in considerable quantity. An ounce of bark afforded, in Sir H. Davy's experiments, one hundred and eleven grains of solid matter by lixiviation, of which seventy-seven were tannin; but the proportions vary in quantity according to season and the age of the tree which yields the bark. Cut in the spring, it will be found to contain four times as much tannin as when obtained in winter.

MEDICAL PROPERTIES AND USES.—Oak bark is a powerful astringent and tonic, and united with bitters and aromatics has been recommended in intermittents. When Cinchona bark cannot be obtained, and the stomach rejects its preparations, oak bark may be found of service, but the former is so superior to all its competitors, that oak bark is but a poor substitute. It is more useful in internal passive hæmorrhages and diarrhœa, and may be

given in doses of from fifteen to thirty grains every six hours. A strong infusion or decoction is often employed as an astringent gargle for cynanche and relaxation of the uvula ; as an efficacious injection in prolapsus uteri, leucorrhœa and profuse menorrhagia ; and as a fomentation in prolapsus ani and hæmorrhoidal affections.

OFF. PREP.—Decoctum Quercus, L. E.

Extractum Corticis Quercus, D.



QUERCUS INFECTORIA.

Oriental Gall Oak.

SPEC. CHAR. *Leaves* ovate-oblong, smooth on both sides, deeply toothed, somewhat sinuated, deciduous. *Calyx*, tessellated. *Fruit*, sessile. *Nut*, elongated, nearly cylindrical.

Syn.—*Quercus infectoria*. *Olivier Voy. dans L'Empire Othoman, Atl. t. 14, 15;*
Willd. Sp. Pl. v. 4. p. 436.
Farber Eiche. Nom. Triv. Willd.

OLIVIER appears to have been the first who clearly pointed out this species as being the tree which produces the nut-galls of commerce, although *Quercus cerris* is still retained by the Edinburgh college. The gall-oak, according to this distinguished traveller, is scattered throughout all Asia Minor, from the Bosphorus as far as Syria, and from the coasts of the Archipelago, as far as the frontiers of Persia.* Captain Kinneir says that the tree is common in Kurdistan and Armenia;† and General Hardwicke, in the narrative of his journey to Sirinagur, asserts that he found this *Quercus* growing in the neighbourhood of Adwaanie;‡ the greater part, however, of the galls found in the Indian Bazaars are supposed to be the product of Persia, from whence they are brought by the Arab merchants. This oak seldom exceeds the height of six feet, and the stem is crooked, with the habit of a shrub rather than a tree. The leaves are an inch and a half long, on short petioles, deciduous, of a bright green colour, and smooth on both sides, but paler beneath; with their serratures deep and broad, not acutely pointed. The fruit is solitary, and

* See *Olivier's Travels*, (translation,) p. 41.

† *Geographical Memoir of the Persian Empire*, p. 258.

‡ *Asiatic Researches*, v. 6. p. 376

nearly sessile. The acorn is smooth, cylindrical, and two or three times longer than the cup, which is slightly downy, with indistinct scales. The galls are produced on the young branches, from the puncture of a small hymenopterous insect of the Linnaean genus *Cynips*, but which was first described by Olivier in the *Encyclopédie Méthodique*, under the name of *Diplolepis gallæ tinctoriæ*. The insect punctures the tender shoot with its curious spiral sting, and deposits its egg in the puncture. In a few hours the cellular tissue swells, a tumour is produced, and the egg becomes inclosed in a fleshy chamber, which not only serves for shelter and defence, but also for food ; the larvæ feeding upon its interior, and there undergoing its metamorphosis. The oak-apple is an excrescence of the same nature, though effected by a different species of insect. “ No productions of nature,” says a celebrated entomologist, “ seem to have puzzled the ancient philosophers more than galls. The commentator on Dioscorides, Matthiolus, who, agreeably to the doctrine of those days, ascribed their origin to spontaneous generation, gravely informs us that weighty prognostications as to the events of the ensuing year may be deduced from ascertaining whether they contain spiders, worms or flies. Other philosophers, who knew, that excepting by rare accident, no other animals are to be found in galls, besides grubs of different kinds, which they rationally conceived to spring from eggs, were chiefly at a loss to account for the conveyance of these eggs into the middle of a substance in which they could find no external orifice. They therefore inferred that they were the eggs of insects deposited in the earth, which had been drawn up with the roots of trees along with the sap, and after passing through different vessels had stopped, some in the leaves, others in the twigs, and had there hatched and produced galls. Bede’s solution of the difficulty was even more extraordinary. This philosopher, who had so triumphantly combated the absurdities of spontaneous generation, fell himself into greater. Not having been able to witness the deposition of eggs and the parent flies in the plants that produce galls, he took it for granted that the grubs which he found within them could spring from eggs ; and he was un-

willing to admit their origin from spontaneous generation,—an admission which would have been fatal to his own brilliant discoveries. He therefore cut the knot, by supposing that to the same *vegetative soul*, by which fruits and plants are produced, is committed the charge of creating the larvæ found in galls." On the plate we have given an accurate figure of the nut-gall insect drawn by Mr. Charles Curtis, and have drawn up the subjoined description for the information of entomologists.*

QUALITIES AND CHEMICAL PROPERTIES.—Two kinds of gall-nuts are met with in commerce. The first being the produce of the first gathering, before the fly has issued from the gall; they are of a blackish blue, or deep olive colour, unequal, warty on their surface, hard to break, heavy, and of a close compact texture, are named *yerli* by the natives, and known in trade by the names *black* or *blue galls*, and *green galls*. The others being gathered afterwards and pierced by the insect, are of superior quality, and denominated *white galls*. They are of a pale brown or whitish colour, smooth, round, easily broken, less compact, and of a larger size. Another sort of gall (fig. *e*) is said by Olivier to be found on the same oak. It is much larger than either of the others, spongy, very light, of a brownish red colour, covered with a resinous coat, and furnished with a circular row of tubercles placed nearly towards the most prominent part. The best galls come from Aleppo, in bags and cases.

With the assistance of heat, galls are almost entirely soluble in water: the decoction precipitates the oxides of iron of a deep

* DIPLOLEPIS GALLÆ TINCTORIÆ.

ORDER Hymenoptera.

FAM. Diplolepidae, Latr.

Genus CYNIPS. Linn. Fabricius.—DIPLOLEPIS. Oliv. Ency. Method.—Latreille.

Hist. Nat. des Crust. et des Insect. v. 13. p. 206.

This insect (fig. *a* pl. 152) is about one-fourth of an inch long, and more than half an inch in expanse from the tips of the wings. It is pale testaceous, clothed with a very short silky pubescence; the head is small, the eyes and ocelli black; the antennæ are as long as the thorax, slender, filiform, and composed of 14 joints; the palpi are very short: the thorax is large and globose, with two or three impressed longitudinal lines or channels on either side; the scutellum is globose, and prominent; the abdomen is not longer than the thorax, sub-globose, compressed, shining, vitreous, and blackish at the base; the ovipositor is exerted in the female. The superior wings are much larger than the inferior, and have a few nerveurs at the costa and base. The legs, which are six in number, are rather short. The larva (*b*) is naked, and changes into a *chrysalis* or *pupa*, inclosed in a crustaceous covering (*obtecta*). Fig. (*d*) represents a gall broken transversely, to shew the cavity from whence the insect has escaped.

black colour, and forms the well-known substance, ink. The infusion reddens the vegetable colours from the action of the gallic acid, which may be obtained from it in considerable quantity, merely by sublimation. The solution contains a large quantity of tannin, as it gives a very copious precipitate with solution of gelatin. It has also been supposed to hold dissolved extract and mucilage: the existence of the former is doubtful, and Dr. Bostock's experiments prove that there is no sensible portion of the latter. The strongest infusion Sir H. Davy could obtain at 56° Farh., by repeated infusion in distilled water, of the best Aleppo galls, broken into small pieces, was of the specific gravity of 1.068. Four hundred grains afforded by lixiviation 185 grains of dry solid matter, of which 130 were tannin, 31 gallic acid, 12 saline and earthy matter, and 12 *supposed* to be mucilage and extractive matter. According to Prof. Branchi, galls by distillation with water afford a concrete vegetable oil, and M. Chevereul in 1815 also discovered in them a new acid, which M. Braconnot has absurdly proposed to call *ellagic*, from the word *galle* reversed.

MEDICAL PROPERTIES AND USES.—Galls being most powerful astringents, have been occasionally prescribed when such remedies are indicated, in long protracted and obstinate diarrhœas, intestinal hæmorrhages and intermittents; and when judiciously combined with tonics and aromatics, have been found useful. Much caution is required in administering so powerful a medicine; and the dose should not exceed ten grains or a scruple, three times a day. An infusion made with two drachms of bruised galls to twelve ounces of boiling water, may be used as an injection, and in conjunction with a small portion of spirits of wine forms a good gargle for relaxation of the uvula and surrounding parts. One drachm of the powder to eight of lard, constitutes an efficacious application to sore nipples and chronic piles; and to increase its utility in the latter complaint, a little opium is occasionally added. An infusion of galls is the best remedy against an overdose of ipecacuanha, almost immediately rendering it inert.

OFF. PREP.—Tinctura Gallarum, E. D.



CLIII

SCILLA MARITIMA.

Officinal Squill, or Sea Onion.

Class VI. HEXANDRIA—Order I. MONOGYNIA.

Nat. Ord. CORONARIÆ, Lin. ASPHODELI, Juss.

LILIACEÆ, De Cand.

GEN. CHAR. *Corolla* inferior, of six ovate-oblong petals, spreading, deciduous. *Stamens* thread-shaped.

SPEC. CHAR. *Bulb* coated, pear-shaped, scaly at the top. *Flowers* much earlier than the leaves, in a strong, dense, cylindrical cluster. Lower *bracteas* elongated at the base.

Syn.—*Scilla Hispanica vulgaris.* Ger. Em. 171; Clus. Hist. 171.

Scilla rufa magna vulgaris. Bauh. 2. 615.f.

Scilla vulgaris radice rubra. Bauh. Pin. 73.

Sancratium. Clus. Hup. 293.

Ornithogalum Squilla; Bot. Mag. v. 24, t. 918.

Ornithogalum maritimum. Tourn. Inst. 381; Brotero Fl. Lusit. 1. 583; Fl. Franc. 3. 276.

Scilla maritima. Lin. Sp. Pl. 412; Willd. 2. 125, Aut. Kew. v. 2. p. 262, Redout. Lilac. t. 116; Woodv. t. 118.

FOREIGN.—*Scille*, Orignon marine, Fr.; *Scilla*; *Cioppollo marina*; *Sancrazio*, It.; *Escilla*, *Cebolla albarana*, Sp.; *Esquilla*, *Cebolla alvariu*, Port.; *Squille*; *Miesmüchel*, Ger.; *Skille*, Dan.; *Skille*, Swed.

THIS valuable article of the vegetable materia medica is a native of the sandy shores of France, Spain, Portugal, Italy, Sicily, Syria, and the Levant. Sometimes it is found far inland: for instance, at the foot of the Estrella mountains; so that, as Link observes, *maritima* is rather a fallacious appellation. It thrives well in this country, in large garden pots, and was cultivated by Parkinson in 1628; but requires protection during winter in a common garden frame. With us, it blossoms in April and May; but in its native soil the flowers are said to be produced in July and August; the leaves appearing in October and November.

The bulb, improperly called the root, is sometimes as large as

the abstraction of blood, and the use of other evacnants, squills are generally considered as too stimulant, which effect may be controlled by a judicious combination with nitre, or tartarized antimony. As an expectorant it is particularly useful in whooping-cough; and although its effects as an emetic are truly distressing, it is the one usually employed in this obstinate disease. To produce expectoration the syrup or vinegar of squill are generally employed, the dose of the former being a drachm; of the latter, half that quantity, repeated every four or five hours. When vomiting is required, larger doses, oftener repeated, are necessary.

As a diuretic, squill is a valuable medicine, and is given in its recent or dried state. The dose of the former is from five to fifteen grains; of the latter, from one to three: the smaller dose should be commenced with, morning and evening, in the form of a pill, and gradually increased in quantity until the diuretic effect is obtained. By some it has been recommended to give it so as to induce some degree of nausea; but it is very distressing to the patient, and often obliges us to discontinue a medicine of undoubted utility; for if the stomach once rebels against it, it is seldom that it can be given in such doses again. Combined with mercury its diuretic effects are materially increased, the former appearing to rouse the absorbents, while the latter stimulates the kidneys. This combination is particularly adapted to those cases in which dropsy depends on, or is connected with enlargement, torpor or chronic inflammation of the liver. Of the mercurial preparations the mercurial pill, and calomel, are generally preferred, though Cullen recommends the oxymuriate. When the mercurial preparations induce purging, the diuretic action of the squill will be suspended. This effect must therefore be obviated either by substituting frictions with the ointment, or by corrective medicines.

OFF. PREP.—Acetum Scillæ, L. E. D.

Oxymel Scillæ, L. E. D.

Pilulæ Scillæ, comp. L. E. D.

Pulvis Scillæ, E. D.

Syrupus Scillæ maritimæ, E.

Tinctura Scillæ, L. D.

FICUS CARICA.

*Common Fig-tree.**Class XXIII. POLYGAMIA.—Order III. TRICECIA.**Nat. Ord. SCABRIDÆ, Lin. URTICÆ, Juss. URTICÆ, De Cand.***GEN. CHAR.** *Flowers* on the inside of a fleshy turbinate receptacle, nearly closed at the mouth.*Male. Calyx* 3-cleft. *Corolla* 0. *Stamens* three.*Female. Calyx* inferior 5-cleft. *Corolla* 0. *Pistil* 1.*Seeds* roundish, compressed.**SPEC. CHAR.** *Leaves* 3 or 5-lobed, scabrous, bluntish, wavy or somewhat toothed. *Fruit* top-shaped, umbilicated, smooth.*Syn.—Ficus. Rau Hist.* 2. 1431; *Bauh. Hist.* 1. 128, *Matth. Valgr.* V. 1. 261. *f.*, *Dod. Pempt.* 812.*Ficus et Chama-ficus. Ger. Em.* 1510.*Ficus folius palmatus. n.* 1607. *Hall. Hist.* v. 2. 280, *Hort. Cliff.* 471; *Trew. Errht.* 1. 73, 74, *Gouan Hort.* 521; *Scop. Carn.* 1251.*Ficus carica. Lin. Sp. Pl.* 1513; *Willd. v.* 4. 1131, *Vahl. Enum.* 2. 204, *Hort. Kew.* 3. 449; *Stokes*, 4, 361, *Woodr. v.* 2. t. 130.*Foreign.—Figuier commun, Fr., Higuera mucho, Sp; Figuera brava, Port., Feigenbaum, Ger.; Mao hoa qua, Chin.*

THE Fig-tree is considered as a native of Asia; but has been cultivated in the south of Europe from the most remote antiquity. "It was probably," says a late writer, "known to the people of the East before the Cerealia; and stood in the same relation to men living in the primitive condition of society, as the banana does to the Indian tribes of South America, at the present day. With little trouble or cultivation it supplied their necessities; and offered, not an article of occasional luxury, but of constant food, whether in a fresh or a dried state. As we proceed to a more advanced period of the history of the species, we still find the fig an object of general attention.

The want of blossom on the fig-tree was considered as one of the most grievous calamities by the Jews. Cakes of figs were included in the presents of provisions by which the widow of Nabal appeased the wrath of David.* In Greece, when Lycurgus decreed that the Spartan men should dine in a common hall, flour, wine, cheese, and figs, were the principal contributions of each individual to the general stock. The Athenians considered figs an article of such necessity, that their exportation from Attica was prohibited. At Rome, the fig was carried next to the wine in the processions in honour of Bacchus, as the patron of plenty and joy ; and Bacchus was supposed to have derived his corpulency and vigour, not from the wine, but from the fig. All these circumstances indicate that the fig contributed very largely to the support of man ; and we may reasonably account for this from the facility with which it is cultivated in climates of moderate temperature. Like the cerealia, it appears to flourish in a very considerable range of latitude ; and in our country frequently produces fine fruit, without much difficulty, in the open air.”† The fig is said to have been first introduced into this country, in 1525, by Cardinal Pole ; and two trees which were brought from Italy, are still in the Archbishop’s garden at Lambeth. They are of the white Marseilles kind, and bear excellent fruit. They are of extraordinary size, the trunk of one being twenty-eight, and the other twenty-one inches in circumference. In this country, fig-trees require good walls, with a south or south-east aspect ; but in some parts of England, as about Worthing in Sussex, they are trained as standard trees, and produce abundance of fruit, which ripens in August and September.

The stem seldom exceeds fifteen feet in height ; is branched from the bottom, and exudes, when wounded or broken, a milky juice. The branches are long, twisted, round, pliant, rough when young, and covered with an ash coloured bark. The leaves are deciduous, nearly a span in length, rough on the upper surface, petioled, and irregularly divided into three or five

* 1 Samuel xxv. 18.

† *Library of Entertaining Knowledge*, v. 11. part 2. p. 242.

lobes, of which the central one is the largest ; they are of a deep green colour above ; somewhat paler, and rather more downy beneath ; with prominent radiating ribs, one to each lobe, and many transverse reticulated veins. There is no visible flower ; for the fruit in its early stage serves as a common receptacle, containing in its cavity both the male and female florets, each of which has a proper calyx, that becomes pulpy, and invests the seed, as in the mulberry. It is turbinate, fleshy, concave, umbilicate, and nearly closed with numerous small scales near the orifice. The uppermost florets, or those near the orifice, are generally *males*, and the others, more numerous, *females*, all separately stalked. The former has the calyx divided into three segments, rarely more, which are lanceolate, erect, and equal : there is no corolla : the filaments are three, bristle-shaped, the length of the calyx, and furnished with two-lobed anthers : the pistil is a twisted deciduous rudiment only. The calyx of the female flower is divided into five deep, lanceolate, pointed, straight, nearly equal segments : there is no corolla : the germen is oval, with a tapering awl-shaped style, and furnished with pointed, reflexed, unequal stigmas. The calyx, which becomes enlarged and pulpy, contains a roundish compressed seed. The fruit is solitary, on a thick short stalk, tapering at the base, and furnished with a three-leaved involucre. It is generally of a deep purple or reddish green colour, with a fleshy, soft, and fragrant pulp. Fig. (*a*) exhibits a section of the unripe fruit ; (*b*) a section of the ripe fruit ; (*c*) represents a section of the fruit or common receptacle, studded with florets ; (*d*) green fruit, exhibiting the umbilicus ; (*e*) two views of the female florets ; (*f*) the male florets ; (*g*) the seeds, all magnified.

The varieties of the common fig are very numerous. Miller enumerates fourteen sorts as deserving of cultivation in this country ; of these the most esteemed are the Brown Ischia, the Black Ischia, the Black Genoa, the Brunswick, or Madonna, the Brown Italian, and the Common Blue, or purple fig.

The *Ficus carica* in its wild state is a more humble and distorted shrub, bearing fruit of very inferior quality as to flavour : but the parts of fructification are very perfect, and the seeds are duly ripened even in France. Such figs as are seen to fall off before they arrive at

immaturity, are carefully collected in the Levant, and branches of the tree are suspended by threads, above the fruit, to impregnate the female blossoms of the cultivated fig. As the cultivated fig is mostly found to contain female flowers only, the seeds would not in general be perfected, were it not for an insect, the *Cynips psenes* of Linnæus, which conveys the pollen from the wild fig to the cultivated ones, and deposits its eggs within the cavity, seeming to act beneficially, not only by carrying in the fertilizing dust and dispersing it, but also by penetrating the pulp, and occasioning a dispersion of the nutritious juices. By this process, which is termed *caprification*, impregnation is not only more certainly accomplished, but the ripening of the fruit is greatly promoted. In France, caprification is imitated, by inserting straws dipped in olive oil; and in this country it has been proposed to hasten the maturation of figs, by cutting out circles of bark of the tree, thus interrupting or retarding the circulation of the sap, care being taken at the time not to injure the albumen.

In warm climates two crops are produced annually, one upon the former year's shoots, and another on the shoots of the same year. The last of these crops is the one which is dried, which is done either by the heat of the sun, or by means of an oven. They are then packed very closely in the small chests in which they are imported into this country. In the Levant, the principal port for the exportation of figs is Smyrna. The import of figs to Great Britain alone, which is principally from Turkey, amounts to nine hundred tons annually, subject to a duty of 1*l.* 1*s.* Dried figs form also a very considerable article of commerce in Provence, Italy, and Spain; besides affording, as in the east, a chief article of sustenance to the native population. In Spain the principal exports of dried figs are from the provinces of Andalusia and Valencia; though the fruit grows, more or less, in every province. In the northern parts of France there are many fig-gardens, particularly at Argenteuil near Paris, where the culture of the fig-trees is one of the chief employments of the people.

QUALITIES, PROPERTIES AND USES.—Fresh figs, when ripe, are soft, and succulent, and, eaten with moderation, are a digestible, wholesome, and very delicious fruit. If too many be partaken of, they occasion flatulency, and sometimes diarrhœa, attended with pain. The dried fruit is too well known, both in appearance and taste, to render it necessary that we should say more than that figs consist almost entirely of mucilage and sugar.

Figs are used medicinally in what are termed pectoral or demulcent decoctions, which are the common drinks often recommended in inflammation of the first passages, and in affections of the urinary organs. Two ounces boiled in half a pint of water, and strained, form a useful gargle for inflammatory sore throat, when suppuration takes place. They are also occasionally eaten to remove habitual costiveness. The most ancient cataplasm on record, is that which was used by Hezekiah, who lived 260 years before Hippocrates. "And Isaiah said, Take a lump of figs. And they took and laid it on the boil, and he recovered." Roasted and split, they are still employed hot, as applications to gum-boils, and other circumscribed maturing tumours.

OFF. PREP.—Decoctum Hordei Comp. L.D. Confectio Sennæ, L. Electuarium Sennæ Comp. E.



CASSIA FISTULA.

Purging Cassia.

SPEC. CHAR. *Leaflets* in five pairs, ovate-lanceolate, smooth ; petioles without glands.

Syn.—*Cassia fistula Alexandrina*. *Bauh. Pin.* 405 ; *Tourn. Inst.* 69 ; *Raii Hist.* 1746. *Commel. Hort.* 1. p. 215. t. 110 ; *Rumph. Amb.* 2. p. 83. t. 21.

Siliqua aut *Cassia purgatrix arabum*, carobiis similis. *Lob. Ic.* 2. 104.

Cassia nigra. *Dod. Pempt.* 787.

Conna. *Rheed. Malab.* v. 1. p. 37. t. 22.

Cassia solutiva. *Matth. Valg.* v. 1. 45. f.

Cassia fistula. *Lin. Sp. Pl.* 540 ; *Willd.* v. 2. p. 518 ; *Hort. Kew.* v. 3. p. 27 ; *Plenck. Icon.* t. 327 ; *Swartz. Obs.* 59 ; *Alpin. Ægypt*, p. 2. t. 1 ; *Hernand. Mexic. Blackw.* t. 381 ; *Sloan. Jam.* 2. 42 ; *Woodw.* t. 163 ; *Stokes*, v. 2. p. 453. *Gærtn.* v. 2. t. 147.

FOREIGN.—*Casse de Contiques*, Fr. ; *Cassia Fistola*, It. ; *Canasistola*, Sp. and Port. ; *Rohrenrachtige Cassie*, *Fistulkassie*. Ger. ; *Cassie*, Dan. and Swed. ; *Tlai Xiem*. Cochinch.

THIS species of *Cassia* is a native of Egypt and the warmer parts of the East Indies, and is naturalized in the West Indies, and South America. It is the *Cassia solutiva* of the Arab and Greek physicians of the middle ages, as appears from the writings of Avicenna and Myrepsus, and is supposed to have received the same generic appellation as that which from time immemorial has distinguished the oriental aromatic spice, from the circumstance of its agreeable odour ; for we are told by Alpinus, when he was in Egypt, in the latter part of the 16th century, that the natives took great delight in walking early in the morning, in the spring season, near plantations of this kind of *Cassia*, regaling themselves with the fragrance of the flowers. The *Cassia fistula* was cultivated in England by Philip Miller, in 1731. Dr. Hasselquist, who observed it on the banks of the Nile, growing among the date trees, near Alexandria, says it flowers in May ; and the Arabs call

it *Hearsciambar*. Bruce asserts, that it is a native of Abyssinia.

It rises, when full grown, to the height of thirty or forty feet, and is branched towards the top. The bark, especially upon the trunk, is brownish, or ash-coloured, very much furrowed and cracked. The wood is white and soft. The leaves are alternate, pinnated, composed of five or six pairs of ovate-oblong, pointed, undulated leaflets, of a pale green colour, finely nerved with a prominent midrib underneath, and supported on short footstalks. The flowers are large, odorous, yellow, veined, and produced in long pendant axillary racemes. The calyx consists of five oblong, blunt, greenish, crenated leaves. The corolla is composed of five petals, which are concave, roundish, unequal, spreading, and waved. The germen is slender, cylindrical, and curved into a semicircle. The fruit is a long woody dark brown pod, about an inch in diameter, and nearly two feet in length, cylindrical, with two longitudinal furrows on one side, and one on the other, divided by thin plates or partitions into transverse cells, each containing one smooth, oval, compressed seed, of a dusky yellow colour, imbedded in a soft black pulp.—Fig. (a) represents the pod or legume; (b) a longitudinal section of the same, showing the position of the seeds; (c) two views of a seed.

The pods are said to undergo a kind of fermentation, to prepare them for keeping. In Egypt, according to Hasselquist, they are collected before they are quite ripe, and carried into a very close room, in which has been prepared a bed of palm leaves and straw, six inches deep. On this they lay the pods in a heap; the door is then closely shut, and the next day they sprinkle water on the heap, which is repeated the day following. In this manner the pods lie heaped for forty days, till they become black. Others, says he, dig a hole in the ground to put them in; but this method is greatly inferior to the former.* Cassia pods are brought to this country principally from the West Indies, packed in casks and cases. The pods of the East India

* See Hasselquist's *Voyages and Travels*.

Cassia are smaller, smoother, and afford a blacker, sweeter, and more grateful pulp, than those which are brought from the West Indies, South America, or Egypt.

QUALITIES.—The pulp, which is the part used, is separated from the woody part and seeds, by passing it through a sieve. It has a faint, somewhat nauseous odour, and a sweet mucilaginous taste.

QUALITIES AND CHEMICAL PROPERTIES.—The pods of Cassia which are heaviest, and in which the seeds do not rattle, are the best, as they contain the greatest quantity of pulp, which is the part used in medicine. The best pulp is of a bright, shining black colour, and of sweetish sub-acid taste. According to M. Henry, it contains sugar, gum, a substance resembling tannin, gluten, and colouring matter soluble in ether.—*Journ. Chim. Med.* ii. 376.

MEDICAL PROPERTIES AND USES.—Both the leaves and flowers are purgative, as well as the pulp. The latter is occasionally used as an agreeable laxative for children; but adults require so large a portion of it to produce effect, that it is never employed for them, excepting when combined with more active remedies. Dr. Cullen conceived that it possessed no advantages over the pulp of prunes, in which opinion we readily coincide. It enters into the composition of the subjoined official preparations, to which it imparts a pleasant flavour.

Confectio Cassiæ, L. E. D.

Confectio Sennæ, L. E. D.

CASSIA MARILANDICA.—*Maryland Cassia.*

SP. CHAR. *Leaflets* in eight pairs, ovate-oblong, equal; a gland at the base of the petioles.

Syn.—Cassia mimosæ foliis, siliqua hirsuta. *Dill. Elth.* 351. t. 260.

Cassia marilandica, *Lin. Sp.* 541; *Willd. v.* 2. p. 524, *Ait. Kew.* 3. p. 29;

Mich. 1. p. 261; *Pursh. Fl. Am.* v. 1. p. 306; *Bart. Med. Bot.* 1. p. 137.

t. 12. *Schkuhr Handb.* 1. p. 355. t. 113.

ENGLISH.—Perennial Cassia. Wild Senna. American Senna.

THE Maryland Cassia, so named by Linnæus, from the country whence it was sent him, is employed in North America as a

substitute for officinal senna. It is extremely common in almost every part of the United States, south and westward of New York, and is figured in Barton's "Vegetable Materia Medica," t. 12. It was first introduced into this country in 1723, by Peter Collinson, Esq., where it flowers from July to October.

Cassia marilandica is a beautiful perennial plant, sending up many slender, often simple, herbaceous, erect, cylindrical, smooth, or slightly hairy stems, to the height of three or four feet. The leaves are alternate, pinnated, composed of eight pairs of ovate-oblong, equal leaflets; of a bright green colour on the upper surface, pale underneath, and furnished with a gland at the base of the petioles. The flowers are a golden yellow colour, in short axillary racemes, on the upper part of the stem. The pods are three or four inches long, a little curved, mucronate, and covered with a few scattered reddish hairs.

MEDICAL PROPERTIES AND USES.—According to Dr. Barton, the virtues of Maryland senna are those of a mild cathartic, little if at all inferior to that of the senna of the shops. This gentleman informs us, that he has employed it in many instances in place of Alexandria senna, and bears testimony to the high character which the plant has long maintained. He says, "the leaves alone have commonly been used; but I have made use of the dried leaves and follicles, carefully rejecting the leaf-stalks, and beg leave to recommend this manner of employing the plant for medical purposes. I believe the best time for collecting it would be when the pods are ripe, which is about the last of August."



PIMPINELLA ANISUM.

*Anise.**Class V. PENTANDRIA.—Order II. DIGYNIA.**Nat. Ord. UMBELLATÆ, Lin. UMBELLIFERÆ, De Cand.*

GEN. CHAR. *Fruit* ovate-oblong, striated. *Calyx* none.
Petals inversely heart-shaped, nearly equal, inflected. *Stigma* subglobose.

SPEC. CHAR. *Radical leaves* 3-lobed; *stem leaves* acutely laciniated. *Germen* downy.

Syn.—Anisum. *Ger. Em.* 1035; *Camer. Epit.* 515; *Fuchs. Hist.* 62. *f. Dod. Pempt.* 299. *f.*; *Rau Hist.* 450; *Park. Theatr.* 911; *Rivm. Pentarp. Irr.* t. 73; *Matth. Valgr. v. 2.* 113. *f.*

Anisum herbariis. *Bauh. Pin.* 159.

Anisum vulgare. *Clus. Hist.* 2. *p.* 202.

Pimpinella Anisum. *Lin. Sp. Pl.* 379; *Willd. v. 1.* *p.* 1473; *Aut. Kew. v. 2.* *p.* 160; *Blackw. t.* 374; *Woodv. v. 3. t.* 180; *Stokes, v. 2. p.* 140.

FOREIGN.—*l'anis*, Fr.; *Anice*, It.; *Anis*, Sp. Port. Ger. Dan. Swed. and Russ.; *Annison*, Arab.

ANISE is a hardy annual, a native of Egypt, but cultivated in Malta and Spain for the seeds, which have been long known in domestic economy, and as an article of the materia medica. In this country the plant requires a warm border, but it is only in very favourable seasons that the seeds are ripened. Many authors mention it as one of the plants raised in our physical herb gardens near London, probably by mistake; for, as Mr. Neill observes, it is certainly too tender to be cultivated in England for profit.

The root is tapering and woody. The stem is erect, branched, solid, round, jointed, striated, slightly rough or downy, and rises about a foot in height. The lower leaves are roundish, indistinctly three or five lobed, unequally toothed, and stand upon scored sheath-like footstalks; those on the upper part of the stem, are divided into narrow, pinnated acute segments.

The flowers are small and white, in flat terminal umbels of many general and partial smooth rays, without any bractæas. The corolla consists of five nearly equal, inversely heart-shaped petals, inflexed at the point. The filaments are five, capillary, spreading, longer than the corolla, and bearing roundish anthers. The germen is inferior, ovate, downy, with capillary, slightly spreading styles, and obtuse, capitate stigmas. The fruit is ovate, separable into two parts, and crowned with the long, capillary, permanent styles. The seeds are oblong, externally convex, each with five rather prominent ribs, the interstices rugose; flat on the inner surface with a longitudinal rib in the middle. Fig. (a) exhibits the root with a radical leaf; (b) an umbel with the seeds; (c) the fruit; (d) a single seed.

The generic name, *Pimpinella*, is supposed by Ambrosinus, whose opinion is adopted by Linnæus, to be a corruption of *bipinella*, or *bipennula*, words expressive of the pinnate or feather-like structure of the foliage. The specific term *anisum* is derived from the Arabic word *anysum*.

QUALITIES.—Anise-seeds have an aromatic odour, and a warm grateful taste, accompanied with a degree of sweetness; water extracts very little of their virtues; alcohol the whole. In distillation with water they afford a pale straw-coloured volatile oil, which possesses the taste and smell of the seeds in perfection. A greenish-yellow inodorous fixed oil is also obtained from anise-seeds by expression, mixed with a portion of the proper essential oil.

MEDICAL PROPERTIES AND USES.—These seeds, in consequence of the essential oil which they contain, are moderately stimulant, and possess the same virtues as a carminative and excitant with others of this class. They are used chiefly in dyspepsia, flatulencies, and in the tormina of infants. Hoffman strongly recommends them in weakness of the stomach, in diarrhœas, and for strengthening the tone of the viscera in general; and thinks they well deserve the appellation given them by Van Helmont, *intestinorum solamen*. Milk drawn from the breast after taking the essential oil, is found impregnated with its odour; and possibly this may be in part, the foundation of the power which it is supposed to possess, of increasing that secretion, and of the pectoral virtues formerly ascribed to it. The seeds may be taken in substance bruised, in doses of from twenty grains to two drachms; or what is preferable, from five to fifteen drops of the oil rubbed up with syrup and camphor mixture.

OFF. PREP.—*Spiritus Anisi*, L. *Spiritus Anisi compositus*, D. *Oleum Anisi*, L. D.



AMYRIS GILEADENSIS.

Balsam of Gilead-tree.

Class VIII. OCTANDRIA.—Order I. MONOGYNIA.

Nat. Ord. TEREBINACEÆ, Juss.

GEN. CHAR. *Calyx* four-toothed. *Petals* four, oblong. *Stigma* quadrangular. *Berry* drupaceous.SPEC. CHAR. *Leaves* ternate; leaflets entire; peduncles, one-flowered, lateral.Syn.—Balsamum. *Theophr. l. 9. c. 6*; *Plin. l. 12. c. 25*; *Justin. l. 36. c. 3*, *Bellon. 110.*Balsamum syriacum, rutæ folia. *Bauh. Pin. 400.*Balsamum verum. *Bauh. Hist. 1. 298*; *Ran Hist. 1755.*Balsamum Alpini cum Carpobalsamo. *Ger. Em. 1528.*Balsamum, ab Ægyptiis Balessan. *Alpin. Ægypt. p. 48. t. 60.*Balsamea meccanensis. *Gleid. Act. Soc. Berol. 3. p. 127. t. 3. f. 2.*Balsamodendron Gihadense. *Decand. Prodr. t. 2. p. 76.*Amyris Opobalsamum. *Forsk. Ægypt. p. 79*; *Niebuhr. v. 1. 307.*βαλσάμου δένδρον. *Theophrasti et Dioscoridis.*Amyris Gileadensis. *Lin. Mant. 65*, *Diss. de Opobals. 1764*; *Willd. v. 2. p. 333*. *Vahl. Symb. i. 28, t. 11*; *Jam. Ill. t. 303. f. 2*; *Woodv. v. 3. t. 192*; *Stokes, 2, 357.*

FOREIGN.—Balsamier de la Mecque; Fr.; Balsamino di Gilead, It.; Gileadischer Balsamstrauch, Ger.

THIS species of amyris, which affords the balsam of Gilead or Mecca, the most precious of the balsams, is a native of Arabia, and was found by Forskal, and also by Niebuhr, growing spontaneously in the mountains of the province of Yemen. The balsam-tree, though not a native of Judea, was cultivated with great perfection many centuries before Christ in the gardens near Jericho, on the banks of the Jordan;* and it was from Gilead in Judea, whence the merchants brought the resinous product to Egypt, that it derived its appellation of *Balsam of Gilead*. Since the conquest of Palestine by the Romans, Mr.

* See Josephus de Bel. Jud. lib. i. c. viii. sect. 6.

Buckingham says the balsam-tree has entirely disappeared, and that not one is now to be found;* but Burckhardt asserts, that it is still partially cultivated in the gardens near the lake of Tiberias.† Mr. Bruce informs us that it is a native of Abyssinia, growing among the myrrh-trees behind Azab, all along the coasts to the straits of Babelmandel.‡

It is an evergreen shrub or tree, seldom exceeding fourteen feet in height, having a flat top, like trees that are exposed to snow blasts or sea air, which gives it a stunted appearance. The trunk is about eight or ten inches in diameter, with many spreading, crooked, purplish branches, having protuberant buds loaded with aromatic resin. The wood is light and open, incapable of receiving a polish, resinous, externally of a reddish colour, and covered with a smooth ash-coloured bark. The leaves are thinly scattered, small, composed of one or two pairs of opposite leaflets, with an odd one; the leaflets are sessile, obovate, entire, veined, smooth, and of a bright green colour. The flowers proceed from the buds by threes; they are small, white, and furnished with a minute slightly bifid bractea, sheathing the base of the pedicel. The calyx is permanent, and divided into four spreading segments; the petals are four, oblong, concave, spreading: the filaments are eight, tapering, erect, bearing erect anthers: the germen is superior, ovate, with a thick style, the length of the filaments, terminated by a quadrangular stigma. The fruit is of a reddish-brown colour, oval, very slightly compressed, pointed, four-valved, and containing a somewhat pointed, smooth nut, flattened on one side, and marked with a longitudinal furrow.

Balm or balsam, is a term commonly applied to resinous substances, which exudes spontaneously from certain plants. It serves very properly to express the Hebrew word עֵרִי, which in the Septuagint is rendered *ρητινυμ*, and by the ancients is indiscriminately interpreted *resin*. But Kimchi, and other moderns, have understood the Hebrew noun to designate that particular spe-

* *Travels in Palestine*, pp. 299 and 300.

† *Travels in Syria*, pp. 323 and 324.

‡ *Bruce's Abyssinia*, App. p. 16.

cies formerly called "*balsamum*" or "*opobalsamum*," and now distinguished by the name of *balsamum judaicum*, or *balsam of Gilead*: celebrated by the ancients for its costliness, its medical virtues, and for being the product of Judea only, and of a particular spot there; which Josephus attributes to the neighbourhood of Jericho, but says that the tree was, according to tradition, originally brought by the Queen of Sheba to King Solomon from Arabia Felix, the country that now principally supplies the demand for that precious drug.

The great value set upon this drug in the East is traced to the earliest ages. The Ishmaelites, or Arabian carriers and merchants, trafficking with the Arabian commodities into Egypt, brought with them מן as a part of their cargo. (Genesis xxxvi. 25; xliii. 11.) Strabo alone, of all the ancients, has given us the account of the place of its origin. "In that most happy land of the Sabæans," says he, "grows the frankincense; and in the coast that is about Saba, the balsam also." Among the myrrh-trees behind Azab, says Mr. Bruce, all along the coast is its native country. We need not doubt that it was transplanted early into Arabia, that is, into the south parts of Arabia Felix immediately fronting Azab, where it is indigenous. The first plantation, says he, that succeeded, seems to have been at Petra, the ancient metropolis of Arabia, now called Beder, or Beder Humhin.

Notwithstanding the positive authority of Josephus, referred to above, and the great probability that attends it, it is observed by Bruce* that his account cannot be put into competition with that of the Scriptures, which 1730 years before Christ, and 1000 before the Queen of Sheba, says, "A company of Ishmaelites came from Gilead with their camels, bearing spicery, and balm, and myrrh, going to carry it down into Egypt;" (Gen. xxxvii. 25;) from which it is evident that it had been transplanted into Judea, flourished there, and had become an article of commerce in Gilead long before the period he mentions. Now the spicery or possession was entirely purchased by the Ishmaelites at the

* *Travels*, vol. vii. p. 149.

mouth of the Red Sea, the market for Indian goods ; and at the same place they must have brought the myrrh, which does not, nor did grow anywhere else than in Sabo or Azabo, east of Cape Gardafan, where the ports of India were, from whence it was dispersed all over the world.

Theophrastus, Dioscorides, Pliny, Tacitus, Serapion, Justin, Strabo, Diodorus Siculus, and Solinus, speaking of its costliness, all say that it came from India. The words of Pliny are, “ But to all other odours whatever, the balsam is preferred, produced in no other part but the land of Judea, and was there in two gardens only, both belonging to the king.” At this time, continues Mr. Bruce, I suppose it got its name of *balsamum judaicum*, or balm of Gilead ; and thence became an article of merchandise and fiscal revenue, which probably occasioned the discouragement for bringing any more from Arabia, whence it was probably prohibited as contraband. We shall suppose that thirty acres planted with this tree would have produced more than all the trees of Arabia do at this day. Nor does the plantation of Beder Humhin amount to much more than that quantity, for we are still to observe that when it had been, as it were, naturalized in Judea, and acquired a name in that country, still it bore evident marks of being a stranger there ; and its being confined to the royal gardens alone, shows that it was maintained by force and culture, and was by no means a native of the country ; and this is confirmed by Strabo, who speaks of it as being in the king’s palace and garden at Jericho. This place being one of the warmest in Judea, indicates their apprehensions about it.

Josephus, speaking of the vale of Jericho, says, “ Now here is the most fruitful country in Judea, which bears a vast number of palm-trees, *besides the balsam-tree*, whose sprouts they cut with sharp stones, and at the incisions they gather the juice, which drops down like tears.” The balsam produced by these trees was of such consequence as to be noticed by all the writers who treated of Judea. Pliny says,* “ This tree, which was

* *Natural History*, c. 25.

peculiar to Juris, or the Vale of Jericho, was more like a vine than a myrtle." Vespasian and Titus carried, each of them, one to Rome, as rarities; and Pompey boasted of bearing them in triumph. When Alexander the Great was in Judea, a spoonful of the balsam was all that could be collected on a summer's day; and in the most plentiful year, the great royal park for these trees yielded only six gallons, and the smaller one only one gallon. It was consequently so dear, that it sold for double its weight in silver. But from the great demand for it, adulteration soon followed, and a spurious sort was substituted. Justin makes this tree the source of all the national wealth. Speaking of the balsam, he says, "The wealth of the Jewish nation arose from the opobalsamum, which doth only grow in those countries; for it is a valley like a garden, which is surrounded by hills, and inclosed, as it were, with a wall. It is called Jericho. In the valley is a wood, admirable for its fruitfulness, as for its delightfulness, being intermingled with palms and opobalsamum trees. The latter have a resemblance to firs, but are lower, and are planted and husbanded like the vine; and on a set season of the year sweat balsam."* In the estimate of the revenues which Cleopatra derived from the regions round about Jericho, which had been given her by Antony, and which Herod afterwards farmed of her, it is said, "this country bears that balsam which is the most precious drug that is there, and grows there only."† The balsam is mentioned in the Scriptures, under the name of "Balm of Gilead." (Jer. viii. 22; xli. 11; li. 8.)

QUALITIES AND CHEMICAL PROPERTIES.—Balsam of Gilead, or of Mecca, says Mr. Milburn,‡ is a resinous juice that distils from a tree, or shrub, growing between Mecca and Medina. The tree is scarce; the best sort is said to exude naturally, but the inferior kinds are extracted by boiling the branches. It is at first turbid and white, of a strong pungent, agreeable aromatic smell, and slightly bitter acrid taste; upon being kept, it becomes thin, limpid, of a greenish hue, then of a

* Justin's *History*, lib. 36.

† Josephus, *Ant. Jud.* lib. xv. civ. sect. 2.

‡ *Oriental Commerce*, p. 71.

golden yellow colour, and, at length, like honey. The *opobalsamum* of the ancients, was the green liquor found in the kernel of the fruit; the *carpobalsamum*, the most in esteem, was expressed from the ripe fruit, and *xylobalsamum* from the small twigs after decoction. It is extremely liable to adulteration, and from its high price and scarcity, we believe that a single ounce of the genuine Balsam of Gilead* is not to be obtained in this country, or even in Europe. To spread when dropped into water, all over the surface, to form a thin iridescent pellicle, so tenacious that it may be taken up entire with the point of a needle, were formerly infallible criteria of the genuine article. It has, however, been observed, that other balsams, when of a certain degree of consistence, exhibit these phenomena equally with the Balsam of Gilead. Mr. Bruce says, “if the balsam be dropped on a woollen cloth, in a pure state, it may be washed out completely and readily with simple water. Dried Canada balsam, or the resinous juice which exudes from the *Pinus balsamea*, is at the present day generally substituted for the real, and if it does not possess its odour, it is equally efficacious.

MEDICAL PROPERTIES AND USES.—This balsam is highly prized among Eastern nations, particularly by the Turks and Arabs, both as a medicine and odoriferous unguent and cosmetic. It has been highly extolled as a powerful antiseptic, vulnerary, and preventive of the plague. In its medicinal properties it agrees with the balsams of Tolu, Peru, and others of the same class; but its great scarcity has prevented it from coming into use among European practitioners.

* **SOLOMON'S CORDIAL BALM OF GILFAD.**—We do not find on examination that this once famous nostrum contains a single grain of the drug whose name it bears. It is, in fact, merely an aromatic tincture of which Cardamoms form a principal ingredient, made with brandy, and containing also a portion of tincture of cantharides. It is, therefore, highly stimulating, and in undue quantities must produce the most deleterious effects on the human body.



COPAIFERA OFFICINALIS.

Officinal Copaiva Tree.

Class X. DECANDRIA.—Order I. MONOGYNIA.

Nat. Ord. DUMOSÆ, Lin. LEGUMINOSÆ, Juss. De Cand.

GEN. CHAR. *Calyx* none. *Petals* 4. *Legume* ovate.
Seed one, in a berried arillus.

SPEC. CHAR. *Leaflets* 2 to 5 pairs, ovate-lanceolate, pointed, obtuse, smooth, with pellucid dots.

Syn.—Copaiba. *Piso Bras.* 56.

Coapoiba. *Marcgr. Bras.* 130.

Copahu. *Barr. Hist. de la France équinoct.* p. 40.

Arbre de Copau. *Labat. Amer. v. 2.* p. 365.

Arbor balsamifera Brasiliensis, fructu monospermo. *Rau Hist.* 1659.

Balsamum certarum quarundam plantarum, quas Copaibas vocant. *Bauh. Hist.* 306.

Copaifera officinalis. *Lin. Sp. Pl.* 557, *Willd. v. 2.* 630; *Jacq. Amer.* 133. t. 86?; *Art. Kew. v. 3.* p. 60, *Jam. Ill. t. 342*, *Decand. Prodr. v. 2.* p. 508, *Aubl. Guai. v. 1.* p. 399; *Woodv. v. 3.* t. 37; *Stokes, v. 2.* p. 520.

FOREIGN.—*Le Copaiier officinal*, Fr.; *Copaiba*, It. & Sp.; *Westindischer Copawabaum*, Ger.

THE Officinal Copaiba tree inhabits various parts of South America, particularly Brasil, Guaiana, Venezuela, and the islands of Trinidad and Martinique. It is met with in great abundance about Tolu, sixty leagues from Carthagena, growing promiscuously in the woods among trees which yield the Peruvian and Tolu balsam. The drawing here given was made from specimens in the Banksian Herbarium, collected by Aublet, in Guaiana, compared with specimens of the tree gathered by Stewart in Trinidad, and by Mutis; but from what country was not mentioned, probably Brasil. There are six or eight species, from all of which the balsam is supposed to be now collected by the natives of the respective countries in which they grow; but

the greatest quantity is said to be furnished by the *C. multi-juga*.*

This is a lofty tree with a handsome head; the smaller branches are numerous, zig-zag, with a nearly smooth, brownish, ash-coloured bark. The leaves are alternate, pinnated, consisting of from two to five pair of ovate-lanceolate, smooth, rather wavy, entire leaflets, two or three inches long, pointed, blunt, in some varieties nearly cordate at the base, in others lanceolate, veined, with a stout midrib, narrower on one side than on the other, shining, somewhat coriaceous, not exactly opposite, and placed on short petioles. The flowers are in axillary racemes at the summit of the branches, which are stiff, spreading, the length of the pinnæ, and divided into about eight alternate common peduncles, with the flowers, which are white, sitting closely on them. There is no calyx. The petals are four, oblong, acute, concave, spreading and tomentose within; the stamens are filiform, incurved, somewhat longer than the corolla, and bearing oblong incumbent anthers. The germen is roundish, compressed, and hairy; the style is thread-shaped, incurved, about the length of the stamens, and furnished with an obtuse stigma. The fruit is an oval, subcompressed, coriaceous bivalve pod, containing a single elliptical seed, involved in a berried arillus.—Fig. (a) exhibits a flower; (b) a detached petal; (c) a stamen and anther: (d) the germen and style; (e) the fruit; all slightly magnified except the last.

QUALITIES AND CHEMICAL PROPERTIES. This resinous substance, improperly called balsam, exudes from incisions made in the tree. The juice thus obtained is transparent, of a yellowish colour, an agreeable smell, a pungent taste, at first of the consistence of oil, but gradually becoming thicker, till at last it is solid like resin. Its specific gravity is 0.950. Distilled with water it yields a large portion of volatile oil, on which its virtues in a great measure depend. Nitric acid acts upon this balsam with considerable energy. When one part of the balsam is mixed with four of nitric acid and two parts of water,

* See Hayne, quoted by Dr. Duncan in the Supplement to his excellent Dispen-

and heated, a yellowish solution is formed, similar to the original balsam, but darker. When distilled there comes over with the liquid that passes into the receiver, an apple-green oil, which lines the helm of the retort. The nature of the residue was not examined. When heated with sulphuric acid, it yields a portion of artificial tannin. Benzoic acid has not been hitherto discovered; and it is supposed by the best chemists, that it does not yield it. Copaiba bears a striking resemblance to turpentine, and seems to constitute a class of bodies intermediate between volatile oils and resins. In commerce, two kinds are usually distinguished, viz. the Brazilian, which was formerly thought to be obtained only from Guaiana, and the island of Maranham, and the West Indian, which comes to this country from Martinique and Trinidad. The former is thin, clear, of a pale colour, pleasant aromatic smell, and of an acrid bitter taste; while that from the Antilles is thick, golden yellow, not transparent, and of a less agreeable smell.

ADULTERATIONS. “A considerable quantity sold in London is entirely factitious. A curious trial took place some time since, between the owner of certain premises that were burnt down, and the governors of the Sun Fire Office, in consequence of the latter refusing to indemnify the proprietor for his loss, because the fire had been occasioned by the making of Balsam of Copaiba. It is also adulterated with mastich and oil; M. Bucholz asserts, that if it does not dissolve in a mixture of four parts of pure alcohol, and one of rectified ether, we may infer its adulteration; rape oil is also frequently mixed with it, in which case, if dropped into water, the drops will not retain their spherical form, as they invariably will, if pure.”*

MEDICAL PROPERTIES AND USES.—Balsam of Copaiba is stimulant, diuretic, and cathartic. It appears to act more powerfully on the urinary passages than any other resinous substance, and is, therefore, generally and very successfully employed for the chronic stages of gonorrhœa, for gleet and fluor albus. “It wonderfully deterges,” says an old writer on the materia medica,† “the reins, ureters, and bladder, when ob-

* Paris' *Pharmacologia*, ed. 4. p. 339.

† See Fuller's *Dispensatory*, p. 326.

structed with sand, mucus, or pus ; strengthens them when relaxed, and heals them when ulcerated. It provokes urine, extinguishes its heat, and cleanses off its bloody, foul, and purulent contents, more effectually than any thing I ever met with." Its action is soon manifested by a violet odour in the urine ; and it is very apt to induce nausea, flatulence and diarrhœa, which are best obviated by a few drops of laudanum. By the action it produces on the mucous membrane of the large intestines, it is occasionally employed in what Dr. Good calls diarrhœa tubularis ; and he remarks, that it is generally useful in chronic inflammation, " or irritable condition of the secernments of mucous membranes." In chronic inflammation of the bladder, or cystitis, and in some obstinate forms of chronic bronchitis, spasmodic asthma, and hooping-cough, combined with narcotics and ipecacuanha, it will be found to afford very effectual relief. Even in croup and other inflammatory affections of the membrane lining the larynx and trachea, where it appears desirable to give stimulants, it is sometimes employed ; and is a very efficacious remedy in hemorrhoids of long standing. Dr. Chapman advises copaiba to be poured on half a wine glass of water, to which is to be added slowly, a few drops of a bitter tincture, by which means the copaiba will be collected in a small globule, that may be easily swallowed, and its taste, so nauseous to most patients, entirely masked by the bitterness of the vehicle.

It is generally prescribed in the form of emulsion, in doses of from half to one drachm, three times a day ; or it may be taken on sugar, by which it becomes more disposed to act on the urinary organs. Combined with the liquor potassæ, its effects in the last stages of gonorrhœa are much increased, and we have found the combination in the subjoined form, to agree with most stomachs :

R. Copaibæ $\bar{3}$ ss.
 Mucilaginis Acaciæ $\bar{3}$ ij.
 Mellis despumati $\bar{3}$ vj,
 Liq. Potassæ $\bar{3}$ ij.
 Ess. Limonis $\bar{3}$ ss.
 Aqua Rosæ $\bar{3}$ v.

Fiat mistura ; dosis, cochlearia duo vel tria magna, ter quotidie.



CLIX

PAPAYER SOMNIFERUM.

White Poppy.

SPEC. CHAR. *Capsule* nearly globular, smooth. *Calyx* smooth. *Leaves* notched, clasping the stem, glaucous.

Syn.—Papaver. Hall. Hist. v. 2. 16.

Papaver sylvestre. Rau Syn 308 ; Ger. Em. 370 f.

Papaver sativum. Matth. Valgr. v. 2. 205 ; Camer. Ept. 103 ; Bauh. Hist. v. 3. 390. f.

Μήκων ἥμερος. Theophrasti et Dioscoridis.

Papaver somniferum. Lin. Sp. Pl. 726 ; Willd. 2. 147 ; Fl. Brit. 568 ; Eng. Bot. v. 30. t. 2145 ; Hook. Scot. 168. Decand. v. 2. 81 ; Bull. Fr. t. 57. Woodv. v. 1. t. 185 ; Stokes, v. 3. 181.

FOREIGN.—Pavot des jardins, Fr. ; Papavero domestico, It. ; Adormidera, Sp. ; Dormideira, Port. ; Gartenmohn, Ger. ; Vallmo, Swed. ; Vallmue, Dan.

It is a generally received opinion, that the common garden or White Poppy is a native of the East ; but it has naturalized itself in fields and waste grounds in the south of Europe, and even in England, where it is cultivated, chiefly for the sake of the capsules. These are raised in great quantities at Mitcham, in Surrey, for the supply of the London market ; the average price of each bag containing 3000 capsules, being about 4*l.* 10*s.* The white poppy is found growing spontaneously on the sandy banks of the fen ditches in some parts of Norfolk and Cambridgeshire. We found it growing in great abundance, apparently wild, on a chalky bank, by the side of the Thames, in Ingress Park, Kent, and in an adjoining corn-field. It is a hardy annual, flowering in July, and varying in our gardens in the forms and colours of its rich, beautiful double petals ; but easily changing, if neglected, to its single state, and to a pale purple or white hue, having a deep violet stain on each petal. The largest heads, for medical use, are obtained from the single-flowered kind, here figured, which is extensively cultivated in

Turkey, Persia, India, and other warm climates, not only for the purpose of obtaining opium, but also on account of the bland oil, which is expressed from the seeds.

The root is white and tapering; the whole plant glaucous and generally smooth, though sometimes the upper part of the stem, as in the garden specimen here figured, bears a few rigid spreading hairs. The stem is round, branched, erect, leafy, and rises to the height of three or four feet. The leaves are large, wavy, alternate, obtuse, lobed, and bluntly notched, embracing the stem with their heart-shaped base. The flowers are three inches broad, various in colour, each on a long terminal stalk. The calyx is inferior, and consists of two ovate, concave, obtuse, equal leaves that are deciduous, or drop on the expanding of the petals; which are four in number, roundish, spreading, large, somewhat undulated and white, in the wild specimens bluish-white, with a broad violet spot at the base of each petal. The filaments are very numerous, capillary, much shorter than the corolla, and furnished with erect, oblong, obtuse, compressed anthers. The germen as well as the capsule is nearly globular, smooth, sometimes furrowed, and crowned with a stigma, of eight, ten, or more rays, with a broad, thin, deflexed margin. The capsule is globular, smooth, from two to four inches in diameter, a little compressed at the top and bottom, of one-cell, divided into several marginal cells, and surmounted with the persistent stigma. The seeds are very numerous, small white, or grey, kidney-shaped; and when ripe escape, by the valvular openings under the stem; they are oily, sweet, nutritious, and void of any narcotic power.—Fig. (a) represents a petal of the *wild* poppy; (b) a stamen and anther; (c) the capsule.

MODE OF COLLECTING AND PREPARING OPIUM.—The fresh herb has an acrid and bitter taste; but the petals of the white poppy are somewhat sweet. The unripe capsules, upon being wounded, as they grow, exude plentifully a whitish, opaque, milky juice, which by drying becomes *opium*. The method of obtaining and collecting it in the East Indies has been fully detailed by Mr. Kerr,* who was an ocular witness, and Mr. Davis,† whose accounts agree with that given by Kœmpfer,‡

* *Medical Observations and Inquiries*, v. p. 317.

† *Transactions of the Society of Arts*, v. xvi. p. 273.

‡ *Amantitates Exoticæ*, Fas. 3. Obs. 15.

respecting the mode of collecting opium in Persia. The seeds are sown in quadrangular areas, the intervals between which are formed into aqueducts for conveying water into each area. The plants are allowed to grow six or eight inches from each other, and are plentifully supplied with water till they are six or eight inches high, when a nutrient compost of dung, ashes, and nitrous earth, is laid over the areas. A little before the flowers appear, they are again well watered till the capsules are half grown, when it is discontinued, and they begin to collect the opium. This they effect by making, at sunset, two longitudinal incisions from below upwards, without penetrating the internal cavity, with an instrument that has two points, as fine and sharp as a lancet. The incisions are repeated every evening, until each capsule shall have received six or eight wounds, and they are then allowed to ripen their seeds. The juice which exudes is collected in the morning, by old women and children, who scrape it off the wounds with a small iron scoop, which being inspissated to a proper consistence by working it with wooden spatulas in an earthen pot in the sun's heat, it is formed into cakes for sale.

In India, the *Papaver somniferum* is chiefly cultivated in Bengal, Allahabad, and Bahar. It is a very uncertain crop; and the produce of an acre, according to Mr. Kerr, is from 40lbs. to 60lbs. In Bahar, the cultivation of the poppy, and the manufacture of opium, are carried on so extensively, that 4000 chests of the latter may be exported annually; but it is a general complaint in Europe, that in this, as well as other provinces of Hindostan, the opium is frequently adulterated with cow-dung, an extract of the plant procured by boiling, the gum of a species of mimosa, and various other substances. Opium of an excellent quality, is made from the poppy in some parts of northern Hindostan. In the ceded districts of Mysore, poppies are cultivated not only for the purpose of making opium, but also for the sake of their seed, from which, when ripe, an intoxicating liquor called *post*, is made, that is much drank for inebriation, both by the Mahomedans and Hindoos. The opium made from the poppies grown in the province of Malwah is deemed much inferior to that of Bengal, and is almost always adulterated with oil of sesamum, and other substances. In some of the provinces of the south of India, the poppy is cultivated almost entirely on account of its seed, which is mixed with the sweet cakes that are eaten by the higher ranks of the natives.

In Britain, the Poppy has been cultivated for the purpose of obtaining opium; and specimens of this valuable drug have been produced, and ascertained to be in no degree inferior to the Oriental. In 1796, a Mr. Ball obtained the premium offered by the Society for the Encouragement of Arts, for a specimen of British Opium collected according to the Bengal method; and the same society, in 1819, voted Mr. Young, Surgeon, in Edinburgh, the Gold Isis medal, for his improved mode of collecting opium in Great Britain. By this gentleman, it is proposed to cultivate the poppy not only for its opium but also for its oil; and from his statements it appears that a crop of early potatoes may be raised upon the same space of ground, with the opium and oil by the same culture, and that such a crop will, in a

good season, yield a clear profit of from £50 to £80 per acre, allowing £60 for expenses. "In the summer of 1817," says Mr. Young,* "I cultivated a small field of poppies, containing about 20,000 plants of the *Papaver somniferum* of Linn., out of which I selected two beds, measuring one fall and fourteen square yards, for the purpose of ascertaining what quantity of opium it would produce. I collected myself as much of the milky juice as was equal to one drachm of solid opium in the space of an hour; but as my professional avocations prevented me from regularly superintending the people at work, they did not gather so much as I expected. I ascertained, however, that they could gather at the rate of one drachm in the hour."

I had my poppies sown three different ways. The first broad-cast upon the beds, three feet wide, with an alley between, and thinned out to the distance of four and five inches, when the plants were about two inches high above the ground. The second on beds three feet wide, in rows, six rows to a bed, and six inches between the plants. The third on the spaces between rows of asparagus, two rows of poppies on each space, eight inches between each row, and six inches between the plants; two feet four inches between each double row of poppies occupied by the asparagus. The first produced only one capsule, the second two, and the third three capsules. The plants between the asparagus rows having more room to grow, had not only more capsules, but they were much larger than those sown broad-cast, or in beds in close-rows; and as early potatoes, cultivated in a piece of ground adjoining my crop, were sold for a high price before my plants began to flower, I proposed the following year to have, by this mode of culture, the same quantity of opium, with a crop of early potatoes, as I obtained from an equal measurement of ground where there was nothing but poppies.

"Accordingly, in 1818, I selected a piece of ground in the highest state of cultivation, well manured with horse-dung, in which I planted early potatoes, in rows four feet wide. Furrows were first drawn; in these furrows the dung was laid; then the sets were dropped on the dung, about nine inches asunder, and covered with the hoe. The potatoes were planted in the middle of April; on the middle space between the potato rows, two rows of poppies on each space, and twelve inches between the rows. When the poppy plants were about two inches above the ground, they were at first thinned out by the hoe, and afterwards by the fingers, to the distance of eight inches between the plants. In this manner I raised a crop of early potatoes, equal to 36 bolls per acre. Although the potatoes will not be ready for immediate use before the gathering of opium commences, the whole crop will not be entirely ripe for lifting till after the opium is collected.

"The distance between the poppy plants being wider than last year, upon an average they produced four full grown capsules each, and some of them produced seven or eight capsules; and I gathered this season at the rate of two drachms of solid opium in one hour, while, by the same method of gathering, I could not collect more than

* See *Edinburgh Philosophical Journal*, v. i. p. 258.

one drachm in the same time last year. Supposing one acre had been cultivated in the same manner as that piece of ground on which my experiment was made, the produce in that case would have been equal to fifty-seven pounds, nine ounces, four drachms, and forty-eight grains of solid opium, which is just twice as much as I collected the year before."

"As my poppies were sown about the middle of April, they were ready for bleeding about the middle of July. For making the incisions I use a double-bladed, convex edged knife, having all the blade covered with sealing-wax, except so much of the cutting edge as is sufficient for wounding the external rind of the capsule, without penetrating its cavity, and with which I make one or more double incisions, according to the size of the head, at first longitudinally, and afterwards obliquely upwards from the stalk. This operation commences about a week after the flowers fall, when the capsules discover to the pressure a proper degree of hardness. When the capsule is sufficiently scarified in the manner described, I then cut off, with a sharp scalpel, the capitellum or star, with a thin slice of the external rind round it, and by this last incision I obtained more juice than from a scarification upon the side of the head."

"In my communication," continues Mr. Young, "to Dr. Duncan, relative to *Lactucarium* or *Lettuce-Opium*, published in the second edition of his *Observations on Pulmonary Consumption*, I proposed to gather the opium by means of a sponge. But when I began to collect opium in that way, I soon found that it would not do: for, although the sponge removes the juice more effectually than the flask proposed by Dr. Howison, it cannot be again entirely expressed, because the sponge decomposes or separates the component principles of the milky juice, and the resinous part adheres to the sponge, and soon clogs its pores. I therefore adopted the use of a small common hair-brush, used by painters, and known to the trade by the name of sash-tool, which answers the purpose most completely, and with which I gathered the milky juice, even though some of the plants were laid by wind and rain, as well as if they had been standing erect. I used a camel-hair brush, but found the same objection to it as the sponge. When the brush is sufficiently charged with juice, I scrape it off upon the edge of a tin flask, fastened to the breast of the gatherer, and capable of holding more than a day's gathering. The gatherers follow the bleeders immediately. One bleeder will occupy two gatherers, and if he be very expert at using the knife, he may keep three gatherers constantly employed. The juice is afterwards formed into cakes or balls, by spontaneous evaporation in shallow earthen dishes, placed in a close room, stirring it occasionally during the evaporation of its watery part, to be afterwards kept in bladders.

"The operation of gathering cannot be repeated with advantage oftener than three times a week, upon the same capsules, for no more juice will flow from one wound than what may be collected immediately, and a certain time must elapse before the plant forms more juice. One acre will keep twelve gatherers and six cutters constantly employed. That number can only gather a third part of an acre in one day, and by the time they have gone through the crop, the capsules at that place where they begin to gather, will be ready for the operation being repeated. So that when the milky juice ceases to flow, five operations, as already described, will have been made upon each capsule. Supposing

surface : on cooling, a reddish crystallized matter will be deposited, which is impure meconic acid.

To obtain the *narcotine*, digest the insoluble matter, A, in dilute sulphuric acid, and precipitate the filtered solution by potass or ammonia. The precipitate is impure narcotine, which by solution and crystallization from alcohol, may be obtained pure.

Morphia, on which the medicinal agency of opium depends, is a brilliant crystallized substance, possessing many of the characteristic properties of the alkalies; white, with a silky lustre, greasy to the touch, and friable. Its crystals are tetrahedral prisms, whose bases are rhomboids, more rarely single or double pyramids; sometimes it is found in slender prisms, collected into bundles. It is of greater specific gravity than distilled water; it is inodorous; has an astringent and bitter taste. It is soluble in alcohol, ether, oils, acids, but scarcely in water, four hundred parts of which, according to Derosne, and eighty-two according to Choulant, are required to dissolve one part. It unites with all the acids, except the carbonic, forming salts with them: of the saline preparations, the *sulphate* and *acetate* are those generally employed in medicine. It restores the blue colour of reddened litmus paper; forms an intense blue with the persalts of iron, and reddens with nitric acid. It decomposes the salts of mercury and lead, the muriate of copper and the sulphate of iron; but it forms a triple salt with acetate of copper. It melts when heated, and, like sulphur, crystallizes in cooling. It burns readily, and when heated in close vessels, gives out carbonate of ammonia, and a solid black resinous kind of matter remains.

Narcotine dissolves in the strong acids, but does not at all chemically combine with them; it is readily soluble in ether and alcohol, from which, when sufficiently concentrated, it crystallizes in fine needles or rhomboidal prisms. It is not changed in colour by the persalts of iron, or reddened by the nitric acid, which characters are sufficient readily to distinguish it from morphia. It is without action, even in large doses, when taken internally; and although Magendie attributes the *after effects*, as they are called, of opium to it, this has not been satisfactorily proved.

Meconic acid in a pure state, is a brilliant, perfectly white, crystallized body, reddening with great intensity the persalts of iron; it is soluble in water, alcohol, and ether. It combines with the different salifiable bases, forming salts which are called meconiates. When received into the stomach, it does not seem to exert any deleterious influence on the animal economy, or produce any of the effects of opium.*

* This brief history of the characters and mode of preparing these substances we have extracted principally from an unpublished paper on opium and its salts, by Mr. Morson. Such of our readers as may wish for further information, may consult the Essay of M. Derosne, *Annales de Chimie*, vol. xlv. p. 257; that of M. Sertuerner, *Ann. de Chim. et Phys.* vol. v. p. 21; the observations on that paper by M. Robiquet, same Journal, v. 5. p. 275; the action of morphia and narcotine on the animal economy, by M. Magendie, *Journal de Physiologie expérimentale*; a paper on the same subject by M. Orfila, *Ann de Chim. et Phys.* v. v, p. 288; the article *Opium*, *Traité de matière médicale*, Barbier, vol. ii. p. 467; Report of M. Lodibert, *Bulletin de la Société de Pharmacie*. vol. i. p. 87; and a paper by Dr. Ure in the *Quarterly Journal of Science*, for May 1830.

Mr. Hennel, who examined British opium, found it to contain a larger proportion of morphia than Turkey opium, probably from its being free from all extraneous matter. The common extract of poppies also contains this substance, but not in sufficient abundance to render it advantageous to obtain it in this manner.

EFFECTS OF OPIUM.—The *modus operandi* of opium on the living system has been the subject of the most violent controversy, and diametrically opposite opinions have been maintained respecting it; for while it has been regarded by many as a direct sedative, by others it has been supposed to be the most powerful stimulant. Into the merits of this controversy it is not our business to inquire; but we may remark that, although under certain circumstances it acts as a powerful stimulant, its primary operation is followed by sedative effects, in proportion to the extent of the dose in which it is exhibited. It is now admitted, as Dr. Murray justly remarks, that opium may be exhibited, “so as to obtain from it stimulant and also depressing effects, and that the former are primary, and are obtained from it in a moderate dose, while the latter are secondary, and are only produced by a larger dose.” Opium was formerly supposed to act on the system by the medium of the blood; but modern physiologists have shown that it operates directly on the nervous system, without inducing any change on the circulating fluid. When given in a *moderate dose*, as that of one grain, to a person unaccustomed to its use, it produces excitement which is succeeded by debility, the circulation is accelerated, the pulse becoming soon sensibly increased in fullness, frequency, and force. If the dose is rather larger, the heat of the body is augmented; the respiration is quickened; an elevation of mind, rising to intoxication, or even delirium, is produced; and the different functions, both mental and corporeal, are invigorated. These effects, however, are soon followed by an opposite condition of the body; the action of the sanguiferous system is diminished, the pulse becoming softer, fuller, and less frequent; a degree of languor and drowsiness is produced; the sensibility to external impressions is impaired, so that pain, if present, is allayed, and sleep induced; the skin is warm and moist; all the secretions are diminished, except the perspiration and the flow of milk, which are increased. In many instances this stage of the operation is accompanied with languor, nausea, vomiting, thirst, headache, tremors, and symptoms of general debility; the sleep is disturbed by disagreeable dreams, the bowels become constipated, the urine is diminished, and the appetite is impaired. The stimulant operation of opium generally continues about an hour; but the sedative effects usually last six or eight hours.

Opium taken into the stomach in an *excessive dose*, produces the same symptoms, with greater rapidity; and if a *very large dose* be administered, the fatal result is so immediate, that the primary action is scarcely perceptible. When this is not the case, it acts in the same manner as the narcotic poisons, and the consequences are delirium, flushing of the countenance, tremors, slow and stertorous breathing, a slow and oppressed pulse, stupor, incapability of being roused by stimuli, convulsions and death. But the quantity requisite to produce either, or all of these consequences, must be considered relative merely. In no two cases can we be sure of a similar result from the employment of the same quantity. Peculiarities of constitution; unusual torpor or irritability of the system

and the habitual use of this drug, produce a wonderful variety in its power and effects.* To some constitutions it is injurious in very small doses; the smallest quantity capable of producing death in an adult, being, probably, four or five grains; while instances are continually occurring of as few as ten drops of laudanum destroying infants, to whom it has been improperly administered, to mitigate pain or procure sleep.

The symptoms produced by opium are nearly the same, whether it be taken into the stomach, applied to the divided mouths of the absorbents, or directly injected into the veins. Thus opium, applied externally to an ulcerated or abraded surface, will produce poisonous effects, not so soon indeed, as when it is administered internally, but with equal certainty. "I have known," says Sir Astley Cooper, "opium in water, applied on the surface of a scald in a child, which I really believe, occasioned its death. It produced a violent constipation of the bowels, and convulsive motions of the child's eyes."

The effects of habit in diminishing the powers of opium on the system are truly wonderful, as evinced by the immense quantities that are consumed by the Turks, and other eastern nations, where the established religion prohibits the use of wine. By the natives of these countries it is taken pure, and in the form of extract, and by its effects they find all their cares obliterated. A thousand delicious images and agreeable visions present themselves to their imagination; they give themselves up to frantic and extravagant actions; roaring fits of laughter, and mad proposals distinguish them; they are said to feel a greater propensity for venereal enjoyments; all their passions and desires are exalted; a warlike ardour animates them, and they are prepared to brave death without fear— a resource which the officers of the Turkish armies frequently turn to their advantage. Frequently, too, they abandon themselves to violent fits of madness; they murder or stab all who make the least resistance to them. This state lasts several hours, when dejection and languor succeed; they become cold, melancholy, stupid, and sleepy. The traveller Chardin, in recounting the effects of a certain drink prepared from the capsules and seeds of the poppy, says, "There is a decoction, which they call *Coquenar*, for the sale of which there are taverns in every quarter of the town. It is extremely amusing to visit these houses, and to observe carefully those who resort there for the purpose of drinking it, both before they have taken the dose, before it begins to operate, and while it is operating. On entering the tavern they are dejected, sad, and languishing; soon after they have taken two or three cups of this beverage they are peevish, and as it were enraged; every thing displeases them; they find fault with every thing, and quarrel with one another; but, in the course of its operation they make it up again, and each one giving himself up to his predominant passion, the lover speaks sweet things to his idol; another, half asleep, laughs in his sleeve; a third talks big and blusters; a fourth

* An interesting case is recorded by Dr. Maroet in the first volume of the *Medico-Chirurgical Transactions*, where six ounces of laudanum were taken by a man 18 years of age, and remained in his stomach five hours before any remedies were applied for its removal. He, however, by perseverance in judicious treatment, eventually recovered. Gaubius (*de Meth. concin. form.*) relates a case, where a patient died, in consequence of having taken an *enema*, into which four grains of opium entered.

tells ridiculous stories; in one word, a person would believe himself to be in a madhouse. A kind of lethargy and stupidity succeeds to this unequal and disorderly gaiety; but the Persians, far from treating it as it deserves, call it an ecstasy, and maintain that there is something supernatural and heavenly in this state. As soon as the effect of the decoction diminishes, each one retires to his own home." The Turks have their *teriakhana*, or opium shops, and take *afioni* (opium) in doses of from 10 to 100 grains in a day.* The increasing attachment to wine has diminished the consumption of opium; but there are still to be found *teriakis*, or opium-eaters, who will swallow in a glass of water 100 grains.† It is mixed with rich syrup, and the inspissated juices of fruit, to render it more palatable, and less intoxicating; and is taken in a spoon, or made up into small lozenges, mixed with spices, and stamped with the words *Masch Allah*, literally, "The gift of God." It is supposed, however, that these lozenges contain other narcotics, as those of *hemp*, and seeds of *Lolium temulentum*, as well as opium.

In our own country opium is also taken in excessive quantities, to exhilarate the spirits; and while we are charmed by the rhapsodies contained in the "Confessions of an Opium-Eater," we regret to state, that the vice has been rapidly increasing since his work appeared; for, in such glowing colours are his visions depicted, that it is almost impossible to resist the temptation of trying for once the effects of such mighty magic. Those who habituate themselves to it, are miserable without its stimulus; they look pale and dejected; they require little food, from the torpor induced in the digestive organs; their vigour decreases, and, at last, their mental energies are annihilated. So completely does the habit triumph over the dictates of reason, that few determine to overcome it, so pleasant are the sensations with which its victims are enthralled. We remember once to have measured out a fluid ounce of laudanum, which, as the morning dose, we poured into a glass for a young and beautiful woman, Lady A. L——, who drank it off, at a draught, before us. She was just then recovering from a painful and very protracted illness, during which the habit gradually stole on her; and were we to narrate the quantity of laudanum which her brother took in the course of a week, who was invalided home from Spain, our readers might suppose that we were dealing in the marvellous. He soon sank under his afflictions; while his sister gradually lessened the dose, till she left it off entirely, married, and became a mother.

Dr. Christen, who has written an excellent essay on opium,‡ states some curious facts in noticing the effects of that celebrated drug to augment the physical powers of the body, as well as to elevate those of the mind. The couriers between Surat and Bombay travel stupified with opium, and run on half asleep, although their eyes are open, (*Dict. Port. de Commerce*, iv. 60;) and the Turkish couriers, when tired,

* Mustapha Shatoor, the Smyrna opium eater, was in the practice of swallowing three drachms daily. The "English Opium-Eater" confesses to 8000 drops, (210½ gra.) as his utmost excess; and Garcias, in his History of Drugs and Spices, speaks of a person who took ten drachms every day.

† Hobhouse's *Journey through Albania, and other Provinces of Turkey to Constantinople* in 1809 and 1810. 4to. Vol. ii. p. 945.

‡ *Opium Historiæ, Chemicæ atque Pharmacologicæ investigatum*, per Chr. Andr. Christen, M.D. Vindebonæ. 8vo. 1820.

renew their strength by means of opium. (*ib.*) The Tartars, who traverse the Turkish empire in an astonishing short space of time, carry with them opium only, in the form of wafers, inscribed with the words *Masch Allah*. In mentioning the power of opium to expand the intellectual powers, Dr. Christen mentions the well-known fact, that the celebrated author of the Brownian system, in propounding his theory to his pupils, was in the habit of taking forty or fifty drops of laudanum in a glass of rum, before and during his lecture. The following fact is related by a very distinguished pupil of Brown, who happening to call upon his preceptor one morning, at an early hour, was surprised, as he entered his study, to hear him in the act of giving this order to his daughter:—"Eppy, my dear, gie me the moderate stimulus o' one hundred and fifty draps of laudanum in a glass o' whisky."

Willis, and some other writers maintain that opium destroys virility. Sir Astley Cooper says, a married man who took it freely declared to him that, "though he slept regularly with his wife, it was rather a matter of ceremony than of practical duty, for he never felt the slightest disposition to sexual indulgence." On the contrary, Dr. Christen quotes Alpinus, Cleyer,* and others, who state that this drug is employed as an aphrodisiac by the Japanese, the Chinese, the inhabitants of India, the Egyptians, and the Turks. Jahn relates, that the Turkish women incite the men with opium.† Linneus also mentions, that it is regarded as an aphrodisiac by the Turks.‡ *Opio ingesto erigi mentulam observatum est; Turcæ ad Levenzinum 1664 contra comitem Lud. Souches pugnantes, opio exaltati, turpiter cæsi et octo mille numero occisi mentulas rigidas tulere, referente Dejean, (in Eph. Nat. Cur. Dec. 1. An. 2. Obs. 69. p. 127; et Haller in Præl. ad Boerh. iv. 519)* These effects of opium, however, depend on the dose in which it is exhibited, for in large quantities it undoubtedly enfeebles the sexual powers.

That opium, and even the odour of it, causes sleep, has been an established fact from the earliest period of its history; but it has also been long known that it produces watchfulness instead of sleep, in certain habits, and under peculiar circumstances. Riedlin remarked, above a century since, that a small dose of opium will sometimes procure sleep, when a large dose prevents it. Van Swieten passed a wakeful, jovial night, from having eaten opium, (*Com. 1 p. 118*;) and Zimmerman saw a woman, in whom opium produced watchfulness, whilst she procured sleep by a concentrated infusion of coffee! This effect of opium has been noticed also by Willis, Geoffroy, Gorterus, and many other writers.

Opium suppresses all the secretions, except that of the cuticular discharge, which it generally promotes. Nicander (*Alexiphar. i. 15*) noticed, that the sweat which flowed when opium was administered, often exhaled the odour of opium; and Dioscorides observed that this odour extended itself over the whole body (*l. v. c. 17.*) But Dr. Christen, in the valuable treatise already referred to, remarks, that opium, unless it be combined with diaphoretics, is not always followed by perspiration. Hence the mixed opiates of the ancients, the theriaca and diascordium, were regarded as diaphoretics; and, on the same account, Sydenham exhibited opium on the fifth and sixth day, in small-pox. There are

* *Eph. Nat. Cur.* ii. 10. 35.

† *Mat. Med.* ii. 265.

‡ *Amæn. Acad.* viii. 298.

some facts, however, which are exceptions to the general rule, that opium suppresses all the secretions. Thus the flow of milk is not diminished, but augmented, by opium; the secretion of the bile is also increased, although the excretion is diminished. (*Jahn* ii. 207.) With regard to the alvine excretions, although, in general, opium confines the bowels, instances are on record, which prove that it operates as a cathartic under certain circumstances. In a similar manner, the urinary secretion is not always lessened, when the excretion of that fluid from the bladder is impeded.

MORBID APPEARANCES.—Although numerous instances are recorded, in which opium has proved fatal to human life, the accounts of the appearances on dissection are by no means satisfactory. Even the cases related by Orfila are defective in this respect. From experiments made upon animals, the morbid appearances after death from opium, have been the following. No very marked alteration in the alimentary canal, though in one instance a whitish coat was found upon the mucous membrane of the stomach. The lungs were marked by livid spots, and distended with blood. The blood in the left-ventricle of the heart was generally black and coagulated, though not uniformly so; and the superior portion of the pia mater appeared, in one instance, as if injected.

In the human subject marks of inflammation have been found in the stomach, or discolorations, that by superficial observation might be construed into such. "No alteration can be discovered on dissection," says Orfila, in the digestive canal of persons who have swallowed any of the narcotic poisons; and if facts, contrary to this assertion, be met with in authors, *it is because there have been administered irritating substances capable of producing inflammation.*"

These assertions of Orfila are strongly supported by the subjoined evidence. "A man who was in a state of convalescence from a recent disorder, took a cathartic by order of his medical attendant, and soon after suddenly died. It was supposed that he had been poisoned through some mistake of the druggist. The body was opened, and the œsophagus and stomach were not only red, but here and there livid; in other words, apparently in a state of gangrene. At first these appearances were considered satisfactory evidence that the deceased had in reality been poisoned. The character of the druggist, however, was unimpeachable; and the physician, who reports the case, became convinced, from further examination, that the person had died of his former complaint, in a state of insidious convalescence. It was at length ascertained that he had been in the habit of using a strong infusion of poppies. A similar preparation was made, and administered to a dog; and upon opening his body, the œsophagus and stomach presented the same appearances, in respect of colour, which repeated washings could not remove."*

Another case is recorded in the sixth volume of the Transactions of the Royal College of Physicians, of a woman who had died by laudanum. In this instance the cellular tissue of the pia mater was found to contain water; and the stomach was stained of a red colour, deepest on the edges of the rugæ, evidently from the tincture of cardamoms that had been thrown in during unavailing attempts to preserve life. The *general* redness of the mucous membrane was produced by effusions of blood into the cellular tissue.

* *Journal de Médecine*, tom. vii.

Sir A. Cooper also makes some strong remarks on this subject, when speaking of a fatal case to which he had been called in. "On examination of the body, after death," says Sir Astley, "the stomach appeared to be very much reddened, and a considerable quantity of solid opium was found in it. In all cases of violent death from opium, a reddened appearance of the stomach will be found. I do not, however, believe that it is really inflammatory. Inflammation and a mere *error loci*, from determination of blood to the parts, are very different states. I do not believe that opium has the power of producing inflammation of the stomach; and I mention this, that it may guide your judgment, if you should be called on to give evidence in a court of justice, in a case of this kind. You should make up your mind never to give an opinion as to the death of an individual being produced by a vegetable poison, unless you find that vegetable poison in the stomach, or some strong proof be given that it was administered." When opium is present, it is easily distinguished, whether solid or fluid, by its strong and peculiar smell.*

TREATMENT.—When opium, or any of its preparations, have been taken in undue quantities, the first part of the treatment is to evacuate the stomach of its contents, by means of the stomach-pump, or to expel the poison by vomiting. For this purpose emetics of the most active kind, as sulphate of zinc, or sulphate of copper, ipecacuanha, or tartarized antimony, should be given as soon as possible, and their operation assisted by irritating the fauces, and the frequent exhibition of mustard and water. Sulphate of zinc, or sulphate of copper, are generally used, dissolved in water; the former in the dose of one scruple, the latter in a dose of eight or ten grains. The latter is by far the most powerful; but the following is more to be depended on, and will seldom fail in rousing the action of the stomach, and evacuating its contents.

Rx. Ammoniae subcarbonatis, ℥j.
 Pulveris Ipecacuanhae, ʒss.
 Tincturae Capsici, ʒij.
 Aquae communis, ʒij. Fiat haustus emeticus.

If the patient has lost the power of deglutition, the draught should be introduced by a flexible tube into the stomach. Should these means fail to produce any effect, M. Orfila suggests the injection into a vein of one or two grains of tartar emetic, dissolved in an ounce of water, as a last resource. After the poison has been removed from the stomach, it will be proper to administer, alternately, water acidulated with any vegetable acid, particularly vinegar, and a strong infusion of coffee warmed. The patient ought to be kept constantly on his legs, if capable of standing, at least for several hours. From numerous experiments made on dogs, M. Orfila concludes, that acids, instead of counteracting the effects of opium, aggravate the symptoms, by dissolving the opium, and promoting its absorption into the system; but when the poison has been expelled by vomiting, acids may be advantageously employed, to remove its effects. To assist in obviating the torpor of the stomach, and sustaining the powers of the system, warm brandy and water, or punch, ammonia, ether, aromatic confection, and other cordials, may be advantage-

* An interesting paper on the comparative merits of tincture of galls, ammonia, and iodine, as tests for morphia, will be found in vol. ii. of "*The Lancet*," p. 201.

ously employed. The nostrils may be irritated, from time to time, with a feather dipped in spirits of hartshorn ; a linen rag, wetted with the liquor ammoniæ, may be laid over the scrobiculus cordis, and sinapisms applied to the soles of the feet, or warm fomentations. When there is complete insensibility, with coldness of the extremities, cadaverous countenance, feeble pulse, or a livid hue of the lips and face, the jugular vein may be opened, and a few ounces of blood abstracted. In these cases the warm bath has been found to have a most decidedly beneficial effect, by inducing a flow of blood to the surface, and thus relieving the vital organs. Bleeding, however, should only be had recourse to when the pulse becomes full, in plethoric habits, or where apoplectic symptoms supervene. If a considerable time has elapsed since the opium was administered, and if there is reason to believe that it still remains in the large intestines, it will be necessary to employ active purgatives, and warm stimulating clysters.

MEDICAL PROPERTIES AND USES.—Opium has been employed for ages as the most active and efficient means we possess to support the powers of the system, mitigate pain or irritation, induce sleep, relieve inordinate action, check morbidly increased evacuations, and diminish morbid sensibility. It was known to the ancients, and formed an ingredient in most of the *theriacas* which were esteemed antidotes against poisons. Hippocrates prescribed it in quartans, combined with hyosciamus, mandragora, silphium, and trifolium ; in which practice he was followed by Galen, (*De Ratione Feb. Cur.* c. 15,) who, from his own experience, asserts, that the recurrence of the paroxysm is stopped by the *theriaca*, Alexander Trallianus (lib. xii. c. 8) likewise extols the use of opiates, conjoined with stimulants, in the cure of quartans. Among the moderns, Wedelius, (*Opiologia*, lib. ii. sec. 2. c. 1,) Horstius, (*Problemata Therap.* dec. i. quæst. 7,) Lind, Trotter, the late Professor Gregory, and others, have also strongly recommended the exhibition of an opiate in intermittent fever, previous to the expected approach of the paroxysm. Dr. Lind found, that an opiate given soon after the commencement of the hot stage, produced a more perfect intermission, and rendered a less quantity of bark necessary to complete the cure. A full dose of opium, especially in combination with ether, not only abates the violence of the fit, and shortens the duration of the fever, but has frequently succeeded in checking the paroxysm, when given on its first approach.

In continued fever opium is advantageously employed, where

there are no symptoms of inflammatory action, or of increased determination to particular organs. In typhus, when given in small doses frequently repeated, it is sometimes administered as an useful adjunct to wine and cordials, in obviating debility, and supporting the powers of the system. It is, as Dr. Murray justly observes, "more frequently used to diminish irritation, and lessen that state of increased susceptibility to impressions connected with debility, which frequently gives rise to restlessness, watchfulness, delirium, and spasmodic affections, particularly tremors and subsultus tendinum."* In those cases of typhus that are accompanied with a hot and dry skin, or where there is a tendency to local inflammation, its exhibition is highly improper. On the contrary, when the tongue is moist, the bowels open, and the heat of the surface below the natural standard, opium may be advantageously given to lessen irritation, and procure sleep. In the early stages of the disease, it is indeed a doubtful remedy, and frequently augments the heat of the skin, constipates the bowels, and increases the delirium. A full dose is usually given at bed-time; or, as Dr. Currie recommends, about one or two o'clock in the morning, when the febrile exacerbation at that period begins to subside.

In the exanthemata, particularly in small-pox, opium is often advantageously employed to moderate the irritation connected with the eruption, and to promote the maturation of the pustules. It was prescribed by Sydenham in the early stage, when convulsions precede the eruption; but in this, as in other febrile diseases, its exhibition requires great caution, when the fever is inflammatory. Opium, with camphor, bark, wine, and aromatics, is requisite in small-pox, scarlatina, and other eruptive diseases, when they are accompanied with typhoid symptoms. In the measles, opium may be given with much advantage, after bleeding and other evacuations, if the cough continues troublesome, combined with some diaphoretic.

No doubt can be entertained of the impropriety of exhibiting opium in diseases of a purely inflammatory character: but, in many of the phlegmasiæ, after the inflammatory action is sub-

* *System of Materia Medica and Pharmacu.* ed. 2d. vol. i. n. 147.

duced by general and local bleeding, purging, and the usual antiphlogistic treatment, it is a valuable remedy. In some forms of phlegmonous inflammation, particularly that which attends severe injuries, where the pain is so violent as to deprive the patient of his natural rest, a large dose of opium is occasionally administered, immediately after bleeding, to allay pain, and procure sleep. In that singular affection of the brain and nervous system, called delirium tremens, bleeding has, in general, been found prejudicial, and full and repeated doses of opium the most efficient remedy. During the active stage of pneumonic inflammation, opium is quite inadmissible, on account of its tendency to check expectoration; but in the more advanced periods of the disease, where the inflammatory action has subsided, it relieves the cough, induces refreshing sleep, and encourages diaphoresis. When it is given in combination with calomel, ipecacuanha, or tartarized antimony, so as to determine to the surface of the body, it is often employed with the most beneficial effects, especially in acute rheumatism. In nephritis, in subacute, and chronic bronchitis, in podagra, and in some other diseases of this order, when the tongue is moist, with little constitutional disturbance, advantage will be derived from the exhibition of opium. In that species of mortification of the toes and feet, commonly termed dry or chronic gangrene, in which the patient experiences severe pain, without the usual symptoms of inflammation, opium is almost the only remedy to be depended on.

In the hæmorrhagiæ, opium must be employed with extreme caution; particularly in plethoric habits, or where the disease is connected with highly increased vascular action. It is chiefly indicated where the hæmorrhagy is of the *passive* kind, where the discharge is periodical, or arises from an increased degree of irritability.

In common catarrh, and in the epidemic catarrh or influenza, opium is of great utility when the cough continues urgent, but is highly improper when the febrile symptoms run high. In these cases it is advisable to promote diaphoresis by combining it with antimonials, by which its direct stimulant action on the vascular system is obviated, and its operation is determined to

greater intervals. Its power on the system soon becomes weaker; and from habitual use is much impaired, and very large doses are required to produce its usual effects. In some diseases, too, particularly mania, tetanus and hydrophobia, it produces little sensible effect unless the dose be very large. In the last disease, it has been taken to the extent of two drachms in twelve hours, without abating the violence of the symptoms. Lastly, the operation of opium is much varied by idiosyncrasy, the same dose producing very different effects on different individuals. Too small a dose of opium is liable to produce restlessness or disturbed sleep. The latter effect, with sickness and thirst, and sometimes delirium, are the consequences of a dose rather too large."

The *preparations* of opium most generally employed in medicine in this country, are the acetate and sulphate of morphia, the tincture of opium, and two secret preparations, the *Black Drop*, and Battley's *Liquor Opii sedativus*. The black drop is an acid solution, considerably stronger than laudanum; and the liquor opii is most probably a solution of twenty-five grains of an extract of opium in seven drachms of water, with the addition of one drachm of spirit; the extract employed in its preparation, having been previously deprived of its resin, either by saturating the excess of meconic acid with an alkali, probably with a small quantity of caustic potash, or by repeated evaporations of the common extract. On analysing several samples of this preparation, it was found to contain from four to five grains of morphia *per ounce*, and did not contain any narcotine, although Mr. Battley has stated, in his papers published in the *Medico Chirurgical Review*, that to this substance opium owes its activity. Mr. Battley has evidently mistaken morphia for narcotine, in all his papers on this subject. The following will perhaps be found the best preparation for the administration of opium; at least it has the great advantage of perfect uniformity: it is a solution of morphia of the strength of the *tinctura opii* of the London pharmacopœia.

Dissolve sixty-four grains of acetate of morphia in fifteen ounces of distilled water, with one ounce of proof spirit.

OFF. PREP.—Decoctum Papaveris, L. Extractum Papaveris, L. E. Syrupus Papaveris, L. E. D. Confectio Opii, L. Emplastrum Opii, L. Extractum Opii, L. Vinum Opii, L. Pilulæ Saponis cum Opio, L. Pulvis Cornu usti cum Opio, L. Pulvis Ipecacuanhæ comp. L. E. D. Pulvis Kino comp. L. Tinctura Camphoræ comp. L. D. Tinctura Opii, L. E. D. Electuarium Opii, E. Electuarium Catechu, E. Pulv. Opiatus, E. Pilulæ Opii, E. Tinctura Opii ammoniata, E. Trochisci Glycyrrhizæ cum Opio, E. Opium purificatum, D. Syrupus Opii, D.





COCCULUS PALMATUS.

Palmated Cocculus, or Calumba Plant.

*Class XX. DIOECIA.—Order VI. HEXANDRIA.**Nat. Ord. SARMENTACEÆ, Lin. MENISPERMEÆ, Juss.*

GEN. CHAR. *Sepals* and *petals* arranged in a double series, very rarely in a triple series. *Stamens* 6, free, opposite to the petals. *Carpella* 3-6. *Fruit* drupaceous, reniform, rather compressed, 1-seeded. *Cotyledons* distant.

SPEC. CHAR. *Leaves* cordate, five to seven-lobed; lobes entire, acuminate, somewhat hairy on both sides. *Stem* and *germens* clothed with glandular hair.

Syn.—*Minispermum palmatum*. Willd. *Sp. Pl.* 4. p. 825; Lam. *Dict.* 4. p. 99; Spreng. *Syst. Veg.* v. 2. p. 154; Berry in *Asiat. Res.* v. 10. p. 385. t. 5.
Cocculus palmatus. Decand. *Syst. Veg.* v. 1. p. 323; Ejusd. *Prodr.* v. 1. p. 98. *Curt. Bot. Mag.* v. iv. N. S. t. 2970—2971.

THERE are few articles of the *materia medica* more generally esteemed than *Calumba* root. It is procured from a plant of the natural order of the *Menispermæ*, and was formerly erroneously supposed to derive its name from Columbo, the principal town in the island of Ceylon, which was regarded as its native country. Among the Africans, its name is *Kalumb*. It is spelt *Kalumbo* by the Portuguese, in whose language the *o* is mute, and from this, Dr. Berry tells us, the name originated by which this valuable root is known in Europe. It is a staple export of the Portuguese from Mosambique; and when we consider the quantity exported, it is certainly a remarkable circumstance, that its native country should have been so long unknown. It is, however, now ascertained to grow naturally and in abundance, in the thick forests that are said to cover the shores about Oibo and Mosambique, on the east coast of Africa, and

inland for about fifteen or twenty miles. For this important discovery we are indebted to M. Fortin, a Frenchman, who, when at Mosambique, and engaged in purchasing the root, as an article of trade, procured an entire offset of a larger size than usual. This he brought with him to Madras, in 1805, and presented it to Dr. Anderson, who justly esteemed it a valuable acquisition to India. This being planted, produced a male plant, from which Dr. Berry's figure and description were made. Still, the female flower and fruit was a desideratum; and for the means of making them known to the readers of Medical Botany, we are indebted to the indefatigable exertions of Dr. Hooker, of Glasgow, who, in the Botanical Magazine, for March 1830, has published a full description, accompanied by figures representing portions of the Calumba plant, with admirable dissections, executed by Professor Bojer, aided in the colouring by the faithful pencil of Mrs. Charles Telfair, of the Mauritius. The following description from the above work, is translated from the Latin MSS. of Professor Bojer:—

The root is perennial, composed of a number of fasciculated, fusiform, somewhat branched, fleshy, curved, and descending tubers, of the thickness of an infant's arm, clothed with a thin, brown epidermis, marked, towards the upper part especially, with transverse warts; internally they consist of a deep yellow, scentless, very bitter flesh, filled with numerous parallel, longitudinal fibres or vessels. The stems are annual, herbaceous, one or two proceeding from the same root, about the thickness of the little finger, twining, simple in the male plant, branched in the female, rounded, green; in the full grown plant, below, thickly clothed with succulent longitudinal hairs, which are tipped with a gland. The leaves are alternate, the younger ones thin, pellucid, bright green, generally three-lobed; older ones remote, a span in breath, nearly orbicular in their circumscription, deeply cordate, five to seven-lobed, the lobes entire, often deflexed, wavy on the surface and margin, dark green above, paler underneath, hairy on both sides, with prominent nerves, and supported on round hairy footstalks, about as long as the leaves. In the *male* plant the racemes are axillary, solitary or

two together, drooping, about as long as the petiole, compound, clothed with glandular hairs, and having at the base small deciduous bracteas. The calyx is smooth, consisting of six ovate, acute, nearly equal leaves, arranged in a double series. The corolla is pale green, consisting of six oblong, free petals, with involute margins, and recurved apices, arranged round a central, orbicular disc or gland, in a single series. The filaments are six, thick, shorter than the petals, with terminal, truncated, four-celled anthers: the cells opening internally, and filled with linear, oblong grains, of yellow pollen. In the *female* plant the racemes are also axillary, solitary, simple, patent, shorter than those of the male. The pedicels are furnished with minute caducous bracteas. The sepals or leaves of the calyx are six, in two series, three inferior, smaller, ovate, acute, subpatent, plane, glabrous. The petals are six, rarely eight, green, glabrous, shorter than the germen, and recurved at the extremity. The pistils are three, free, of which two are generally abortive, ovate, acuminate, glanduloso-pilose, and containing one ovule. The style is very short, and the stigma has several spreading points. The fruit is drupaceous or berried, about the size of a hazel-nut, densely clothed with long, spreading hairs, which at their extremity are tipped with a black gland. The seed is subreniform, clothed with a thin black shell, transversely striated.—Fig. (a) exhibits a portion of a male plant, reduced to one-fourth its natural size; (b) the male flower; (c) stamen and petal; (d) the grains of pollen; (e) glandular hair; (f) female flower; (g) pistils—all but fig. a more or less *magnified*; (h) portion of a female raceme, with perfect fruit; (i) seed; (j) embryo, *magnified*; (k) the root, with a portion of two young stems rather less than the size of nature.

The roots are dug up in the month of March, the dry season, or when the natives are not employed in agriculture. The main stock of the root is not removed, but offsets from the base are taken, and those of sufficient size, yet not so old as to be full of fibres, which render it unfit for commerce. Soon after it is dug up, the root is cut into slices, strung on cords, and hung up to dry in the shade. It is deemed fit for commerce, when on ex-

posure to the sun, it breaks short ; and of a bad quality when it is soft or black.

From the following extract from a Memoir which appears to have been read at a Literary and Scientific Society in the Mauritius, by Mr. Telfair, it appears that the culture of colombaroot has been recently introduced into our colonies, in the East Indies.

“ The late Sir Walter Farquhar, Physician to the King,” says Mr. Telfair, “ was very anxious to introduce into England the *Colombo root* in a living state ; and for that purpose he desired his son, Sir Robert Farquhar, Governor of Mauritius, Bourbon, and their Dependencies, to procure the plant from its native soil in Africa, and forward it to London. Sir Robert lost no time, after assuming his government at the conquest of the French Islands, in applying to the Governor of Mozambique for growing plants ; and was repeatedly assured that these should be sent to him at the proper season. These promises, however, were never fulfilled ; although renewed by the several succeeding officials of the Portuguese possessions on the east coast of Africa, ever since the year 1811. Dr. Wallich also took much pains for effecting the same object, and sent to Governor Farquhar the drawing made at Calcutta of a male plant of the *Colombo root*, which had been brought to the Botanic garden there by Mr. Berry. Copies of this drawing were distributed to the different ships of war, and captains of merchant vessels, trading to the eastern coast of Africa, that they might be enabled to distinguish the plant and bring it to the Mauritius ; since there had been an evident unwillingness on the part of the Portuguese authorities to permit this precious vegetable to be taken away, in any other state than what it bears in commerce, when deprived of vegetative power by passing through the oven.

“ All the attempts resulting from these means proved fruitless ; until Captain William Fitzwilliam Owen, commanding the surveying squadron of his Majesty’s navy, on the east African coast, undertook the task. The extensive influence he had acquired by his intercourse with the native chieftains and tribes, enabled him to procure living plants ; while his botanical knowledge secured him against the mistakes committed by others, who had been misled by the local settlers in their search, and imposed on by the substitution of other species instead of the true *Colombo root*. Captain Owen in the year 1825, brought away in his Majesty’s ship *Leven*, from Oïbo, a great number of cases, filled with growing roots of the male and female plants laid down in the sandy loam, which appears to be their favourite soil. No time was lost by him in forwarding a great portion of these to Mr. Telfair, at Mauritius, planting some also at Mahé, in the Seychelles Archipelago, and sending to Bombay several cases, in order to multiply by dispersion, the chances of success in naturalizing them in different climates.

“ The roots that were brought to Mauritius, were partly transmitted to England, New Holland, and America ; but the greater number were

distributed among the various districts of Mauritius and Bourbon. Many of these plants blossomed at Mauritius in the course of a year, but the flowers proved all male. The roots, however, had, during that period, multiplied to twenty or thirty times the original quantity, and thus an opportunity was given for distributing them still more extensively. The female plants flowered at Seychelles, and Mr. G. Harrison, the Government agent there, transmitted some of their roots to Mr. Telfair, in whose garden of Bois Chéri, in the Mauritius, they have flowered, and being fecundated by Professor Bojer, who touched them with the pollen of the male blossom, they bore seeds. From these individuals the drawings by Professor Bojer have been taken, which give a delineation and dissection of every part."

QUALITIES AND CHEMICAL PROPERTIES.—Calumba root is brought to us in round pieces, about a quarter of an inch thick, and formed by transverse sections of the root. These sections are surrounded by bark, externally of a brown wrinkled appearance; internally yellow. The woody part of the root should be of a light yellow colour, solid and heavy. It is, however, often spongy and worm eaten. According to analysis by M. Planche, calumba contains a large proportion of starch, and of a peculiar animal substance; a yellow bitter matter, not precipitated by metallic salts; a small quantity of volatile oil, salts of lime and potass, oxide of iron and silex.* It is in the yellow resinous matter that the properties of the plant reside. The infusion of calumba is copiously precipitated by infusion of galls and yellow cinchona bark, by acetate and superacetate of lead, oxymuriate of mercury and lime-water, from which it is inferred that it contains *cinchonin*.

A spurious calumba is met with in France, which is imported from the states of Barbary. It is known by its not containing starch; and is, therefore, easily detected by the agency of iodine, which does not alter its colour; by its turning black with sulphate of iron, disengaging ammonia by the action of caustic potass, and by its infusion reddening turnsole paper. The root of our common red-berried bryony, *Bryonia dioica*, tinged yellow, with tincture of calumba, is sometimes sold as a fraudulent substitute; and the root of an American plant, *Fraseria Walteri* of Michaux, *Swartzia Fraseri* of Smith, is imported into Liverpool,

* *Bull. de Pharm.* iii. 289.

and dispersed over the north of Europe as the true calumba root. It may be distinguished from the true calumba, by its whiter colour, lighter texture, the admixture of longitudinal pieces, and especially by its taste, which is sweetish at first, and much less bitter than the real calumba.* The tincture of the spurious root gives no precipitate with infusion of galls.†

MEDICAL PROPERTIES AND USES.—Calumba is a powerful antiseptic and tonic, and is free from that nauseous taste which distinguishes many other bitters. It is employed with great advantage in those affections of the stomach and bowels which are attended with an increased formation of vitiated bile, and is often found to check the vomiting in cholera. The vomiting which is so distressing to many females during the first months of pregnancy is also frequently removed by it; and it is one of our most useful and grateful stomachics. By some it is much commended for the diarrhœa and vomiting which are caused by dentition, and Denman recommends it particularly, as preferable to cinchona for the low stage of puerperal fever. In the last stages of pthisis pulmonalis, and in hectic fever, it has been found to check colliquative diarrhœa, to allay irritability, and to impart some degree of vigour to the stomach. It is usually given in the form of infusion, which will not bear to be kept long. It may be combined with aromatics, orange-peel, alkalies, and neutral salts. Sometimes the root is chewed; and the powder, combined with soda, we have found serviceable in pyrosis, in chronic dysentery attended with ulceration of the colon, and some other painful affections of the stomach and bowels.

The dose of the powder is from ten to thirty grains, three times a day.

OFF. PREP.—*Tinctura calumbæ.* L. E. D.

Infusum calumbæ. L. E.

* See Bigelow's *Treatise on the Materia*, 8vo. Boston, 1822. p. 141.

† Stolze, *Berlinisches Jahrbuch für die Pharmacie*, 1820. p. 481.



ASTRAGALUS CRETICUS.

*Cretan Milk-vetch.**Class XVII. DIADELPHIA.—Order I. DECANDRIA.**Nat. Ord. PAPILIONACEÆ, Lin. LEGUMINOSÆ, Juss.*GEN. CHAR. *Legume* gibbous, of two longitudinal cells.SPEC. CHAR. Shrubby. *Petioles* spinescent. *Leaves* pinnate; leaflets lanceolate, hoary. *Flowers* aggregate, axillary, sessile. *Calyx* 5-cleft; the segments longer than the corolla, woolly.*Syn.*—*Tragacantha cretica incana flore parvo lineis purpureis.* Tourn. Cor. 29; Itin. p. 55.*Tragacantha humilior spinosior densius ramificata.* Moris. Hist. 2. p. 1331*Poterium alterum densius ramificatum.* Alpin. Exot. 50?*Astragalus cretensis.* Pall. Astr. n. 6. p. 5.*Astragalus creticus.* Sp. Pl. Willd. v. 3. p. 1330; Lam. Dict. n. 62; Ency. 1. p. 318; Decand. Astrag. p. 166. t. 33.FOREIGN.—*Astragale de Crete*, Fr.; *Eichter Tragacanth*, Ger.

FROM this species, which grows plentifully in Candia, Greece, and many parts of Asia, is procured the *gum tragacanth*, used for various purposes, as well as an article of the materia medica. Tournefort found it growing very common on the naked hillocks about Mount Ida, where, during the summer months, not only the vessels of the bark, but the pores of the wood also, when the branches are cut off, appear turgid with gum. Before Tournefort discovered that the *Astragalus creticus* yields the *Tragacanth* of commerce, it was supposed to be the produce of the *A. Tragacantha* of Linneus. Dr. Sibthorp, who found the *Astragalus creticus* on all the higher mountains of Greece, remarks, that there are different species nearly allied to this, and *A. Tragacantha* which produce gum tragacanth. In travelling

from Smyrna to Prusa, he observed the gum in great abundance on a species with yellowish flowers, growing in low sandy situations. There are, indeed, several species belonging to this genus, almost all confounded by Linneus under his *Astragalus Tragacantha*, most of which yield a gum, although the *A. creticus* is that from which the best tragacanth is generally obtained. Prosper Alpinus describes it as flowing from the stem and branches of this, and *Astragalus echinoides*, and M. de la Billardière, who visited Mount Lebanon in August 1786, the season when the gum is collected, gathered it on *A. gummifer*. In both these species, the gum exudes copiously through natural openings in the bark, to which it adheres and concretes. M. Olivier, the distinguished traveller, however, asserts that the gum tragacanth of commerce is not brought from Candia and other islands in the Levant, but what we receive comes from the northern part of Persia, Armenia, and Asia Minor, where it exudes spontaneously from a nondescript arborescent species, to which he has given the name of *Astragalus verus*.

The *Astragalus creticus* is a low shrub, with a short, thick, woody, blackish procumbent stem, nearly smooth at the lower part, but divided above into several short, erect, or somewhat spreading, scaly branches, beset with sharp spines, the remains of the footstalks and stipules of the former year. The leaves are pinnated, consisting of four or five pairs of small, opposite, unequal, oblong-lanceolate, downy, deciduous leaflets, which are attached to a strong, spinous, persistent footstalk or midrib. The petioles are woody, acuminate, at first tomentose, but afterwards becoming smooth, having attached to the base of each, a pair of membranaceous, broad, downy, pointed stipulas. The flowers are papilionaceous, small, axillary, sessile, solitary, and stand in compact clusters upon the extremity of the branches. The calyx is tubular, deeply divided into five pointed, linear, straight segments, longer than the corolla, and clothed with long white down. The corolla is white, streaked with purple, and consists of a standard, or upper petal, which is ovate-oblong, obtuse, and longer than the rest; two linear, obtuse wings, and an equal, bluntish keel, or carina. The filaments

are ten, nine of them united at the base, bearing roundish anthers. The germen is oblong, villous, and furnished with a straight awl-shaped style, and obtuse stigma. The legume is ovate, somewhat tumid, villous, 2-celled, containing one or more small, kidney-shaped seeds.—Fig. (a) represents the calyx cut open to show the germen.

QUALITIES AND CHEMICAL PROPERTIES. — Gum tragacanth is in irregular lumps, or in long worm-like pieces, variously contorted. The best sort is white and semi-transparent; but it is sometimes greyish, reddish, and opaque. M. Decandolle says, “*Tragacantha mercatoribus preciocissimum semi-pellucidum est; gummi ab A. gummifero collectum omninò pellucidum ostenditur, in aqua infusum non gelatinam efficit, unde vilioris est pretii.*”* When put into water, tragacanth slowly imbibes a large quantity of it, swells into a large volume, and forms a soft, but not fluid, mucilage. It is greatly superior to all the gums, in giving viscosity to water; its power being, in this respect, to that of gum Arabic, as one to twenty-four. If the quantity of water be more than the gum can imbibe, the mucilage forms an irregular mass, which does not unite with the rest of the liquid. When a solution of gum arabic is poured into this solution, the mucilaginous gum tragacanth separates much sooner than usual, and forms no union with the gum arabic. When treated with nitric acid, it yields abundance of salactic acid, malic acid, and oxalic acid; but not the slightest degree of artificial tannin. Sulphuric acid develops some traces of artificial tannin. When Mr. Cruickshanks distilled 480 grains in a glass retort, he obtained the following products:—

Pyromucous acid	. . . . .	245 grs.
Charcoal	. . . . .	93
Lime, with some phosphate	. . . . .	12
Carbonic acid and carburetted hydrogen gas.		130
		<hr/> 480

* *Astragologia*, p. 13.

Dr. Bostock, by digesting tragacanth in water till it became gelatinous, and then triturating it with pure water in a mortar, formed a homogeneous mucilage, consisting of 100 parts of water, and one of tragacanth. Subacetate of lead formed a copious precipitate with this mucilage. Acetate of lead produced a slight precipitate, which increased by standing, though on mucilage of gum arabic it produced no effect. The permuriate of tin likewise throws down a firm coagulum, though it does not alter mucilage of gum arabic. Persulphate of iron, and silicated potass produced no effect. Nitrate of mercury, and the permuriate of tin, each throw down precipitates of a reddish tinge

By Dr. John, gum tragacanth has been considered as pure *cerasin*, but recent observations by M. Bucholz, prove that it consists of two substances in the following proportions :—

Substance analogous to gum arabic	57
<i>Adragantine</i>	43
	<hr/>
	100

Adragantine is scaly, of a dirty white colour, easily reduced to powder, insoluble in cold water, but soluble in boiling water; not acted on by alcohol, but dissolves easily in aqueous potass, and in hydrochloric acid.

MEDICAL PROPERTIES AND USES.—Gum Tragacanth, medicinally, is simply useful as a demulcent; but is less employed than gum arabic, excepting for pharmaceutical purposes, in which it is preferred in the manufacture of troches, on account of its greater viscosity.

OFF. PREP.—Pulvis Tragacanthæ comp. L.

Mucilago Astragali Tragacanthæ. E. D. ¹



SMILAX SARSAPARILLA.

Medicinal Smilax, or Sarsaparilla.

Class XXII. DİCÆIA.—Order VI. HEXANDRIA.

Nat. Ord. SARMENTACEÆ, Lin. ASPARAGI, Juss.

GEN. CHAR. Male. *Calyx* six-leaved. *Corolla* none.
 Female. *Calyx* six-leaved, inferior, deciduous.
Corolla none. *Styles* three. *Berry* three-celled.
Seeds one, two, or three.

SPEC. CHAR. *Stem* prickly, somewhat quadrangular.
Leaves unarmed, elliptical, pointed abrupt, three-
 nerved, somewhat glaucous beneath. Common
 flower-stalk longer than the footstalk.

Syn.—*Smilax aspera peruviana*, sive *Sarsaparilla*. Bauh. Pin. 296.*Smilax peruviana*, *Sarsaparilla*. Ger. Em. 859. 1. f.*Smilax viticulo asperis virginiana*, folio hedaraceo leni Zarga nobilissima.*Pluk. Alm.* 348. t. 111. f. 2. *mala*; Raii Supl. 345.*Smilax glauca*, ramis subteretibus passim aculeatis, foliis quasi cordato-
 ovalibus acuminatis, &c. Mich. Amer. 2. p. 237.*Smilax Sarsaparilla*. Lin. Sp. Pl. 1459; Willd. v. 4. p. 776; Woodv. 3.
 t. 194.FOREIGN.—*Salsepareille*, Fr.; *Salsaparigia*, It.; *Sarsaparillen*—*Smilax*, Ger.

DR. WOODVILLE, of whose figure and description we have here
 availed ourselves, says, “this species of *smilax* is a native of
 South America, flowering in July and August.” It is a climb-
 ing perennial plant, inhabiting the hedges and swamps of Vir-
 ginia; and probably also of Brasil, Mexico, and Peru. The
 root has been long known as an article of the *materia medica*;
 but the roots of more than one species of *smilax* are imported
 from America under the name of *sarsaparilla*. Of these, Her-

nandez mentions four species, the spontaneous produce of the soil, which grow in Mexico or New Spain, viz. *Mecapatli seu Zarsaparilla prima*, *Quauhmecatl seu Zarsaparilla secunda*, *et tertia* ; and *Quauhmecapatli seu Zarsa quarta*.* According to Baron Humboldt, the best sarsaparilla grows on the borders of a lake on the north of the Cerro Unturan, two days' journey from Esmeralda. The sarsaparilla of this district is celebrated at Grand Para, Angustura, Cumana, Nueva Barcelona, and in other parts of South America, by the name of *Zarza del Rio Negro*. It is esteemed the most active of all that are known, and is much preferred to the *sarza* of the province of Carracas, or of the mountains of Merida ; it is dried with great care, and exposed purposely to smoke, in order that it may become blacker. This species of sarsaparilla grows in profusion on the humid declivities of the mountains of Unturan and Achivaquere, where it is collected by the Indians, and brought to the capital. M. Humboldt found twelve new species of smilax in South America, among which the *S. syphilitica* of the Cassiquiare, and the *S. officinalis* of the river Magdalena, are the most esteemed, on account of their medicinal qualities. "The trials made," says this illustrious traveller, "in several botanical gardens of Europe, prove that the *Smilax glauca* of Virginia may be cultivated in the open air, whenever the mean temperature of winter rises above six or seven degrees of the centigrade thermometer ; but those species which possess the most active virtues belong exclusively to the torrid zone, and require a much higher degree of heat." Clusius informs us that Europe received the first sarsaparilla from Jucatan, and the island of Puna, opposite Guayaquil. But the trade of this article is now more active in those parts which have interior communications with the Orinooko, the Rio Negro, and the Amazon.

The root of the officinal smilax is divided into several branches, which are somewhat thicker than a goose-quill, straight, externally brown, internally white, and three or four feet in length ; the stems are shrubby, long, slender, climbing by means of tendrils,

* *Rerum Medicarum Nov. Hispan. Thesaur.* p. 288.

like those of our bryony, a little zig-zag, roundish, with about four slight unequal angles, and beset with strong scattered, awl-shaped, hooked prickles. The leaves are elliptical or ovate, and when full-grown, nearly orbicular, two inches and a half broad, alternate, abrupt, or contracted at each extremity, with a short terminal point; smooth of a deep green colour above, somewhat glaucous beneath, and marked with three strong prominent ribs. The footstalks are short, broad, channelled; each furnished with a pair of long tendrils, subsequently deciduous. The flowers are male and female, upon different plants, lateral, and usually stand three or four together on slender axillary racemes, longer than the footstalks. The calyx of the *male* flower is bell-shaped, divided into six segments, which are oblong, spreading, and reflexed at their points: the filaments are six, simple, and bearing oblong anthers. The calyx of the *female* flower is deciduous, and also bell-shaped, similar to that of the male; there is no corolla, unless the calyx be considered as such, which, from analogy to *Asparagus*, it ought to be: the germen is superior, ovate, supporting three minute styles, with oblong, reflexed, downy stigmas. The fruit is a round three-celled berry, the size of a currant, umbilicated, of a red colour, and containing a solitary seed in each cell, one or two of them generally abortive.—Fig. (a) represents the fruit.

The systematic name, *Smilax*, was originally given to the Yew, *Taxus*; but is likewise applied by Dioscorides to different plants of a climbing nature. One of these he terms *τραχεια*, *rough*, and as the term *smilax* is still applied to this by modern botanists, De Theis supposes the word to originate from *σμιλη*, a *scraper*. The *σμιλαξ* of Dioscorides, simply so denominated, is stigmatized by him as a most virulent poison; while his *σμιλαξ τραχεια* is celebrated as an antidote so powerful, that if given to a new-born infant he can never be poisoned as long as he lives! The specific name is derived from the Spanish *zarza*, a brier or bush, and *parilla*, a little vine.

The dried root is imported from South America, principally from Brazil, packed in bales. According to Humboldt, nearly 5000 quintals are annually exported from Vera Cruz. It is in long, slender twigs, of the thickness of a goose-quill, which, for pharmaceutical purposes, are split and cut in small pieces. It is internally white, with a small woody centre, tough, flexible, and covered with a brownish bark, marked with longitudinal furrows. Three different *varieties* are met with in commerce. 1st. The Honduras, composed of very long roots, often doubled in the bundles. 2nd. The red, or bearded, called also, from its channel of

importation, Jamaica, but the product of Honduras, distinguished by its colour, and the presence of its radicles. 3rd. The Brazilian, or, as it is called, Lisbon, without radicles, which is held in the greatest estimation. There is also a spurious or grey sarsaparilla, which resembles very nearly, in its external appearance, that of Brazil. The roots of this species are dotted with purplish spots, and there is not the white woody centre, which all the known sarsaparillas exhibit. This small creeping root is derived from the *Aralia nudicaulis*, Lin.* There is also known in commerce a red sarsaparilla, the root of a plant belonging, according to M. Virey, to the family of the *Asphodeli*; and what is called the spurious red, which is the root of the *Agave cubensis*. The roots of the *Carex arenaria* and *Carex hirta*, are called German sarsaparilla, and used as substitutes.

QUALITIES AND CHEMICAL PROPERTIES.—This root is inodorous, and has a slightly bitterish, not ungrateful taste. Boiling water extracts from it a portion of secula, in which the virtues of the root appear to reside. The aqueous solution has a brown colour, reddens litmus paper, and affords a precipitate, with infusion of galls. The results of the analysis of sarsaparilla by chemists vary exceedingly; either from their examining different varieties, or conducting the processes in different ways. Pfaff obtained from 100 parts, 2 of balsamic resin, 2.6 of extractive, 3.8 of a substance resembling cinchonia, 2.1 of albumen, 2.9 of water, and 75.7 of woody fibre. Cannobio obtained from the same quantity, 2.8 of bitter acid resin, 5.5 of gummy extract, 54.2 of starch, 27.8 only of woody fibre, and 9.7 of loss: while Mr. Baltka procured, 1, a crystallized acid, which he has named *parillinic*; 2, an essential oil; 3, gum; 4, bassarine; 5, a colouring crystallized matter; 6, starch; 7, albumen; 8, extractive; 9, gluten and gliadine; 10, pectic acid; 11, acetic acid; 12, saline matter, consisting of muriates of lime, potassa, and magnesia; carbonate of lime, oxide of iron and alumina; 13, lignine.

M. Galileo Palotta, an Italian physician, has discovered in this root what he considers its active principle, to which he has given the name of *parigline*.* The process by which it is procured is the following. The sarsaparilla is sliced, or bruised with a pestle, and on a given quantity of the root six times its weight of boiling water is to be poured; the vessel in which this is placed is then covered, and the infusion allowed to continue for eight hours. The fluid is then strained off, and a similar quantity of boiling water is added to the roots, and allowed to remain the same time as the first. The two infusions, when mixed, are of a deep amber colour, slightly bitter, and nauseating. To these mixed infusions lime-water is added, and the whole stirred together with a wooden spatula; the fluid soon changes its colour, becomes brown, and deposits a pulverulent substance, of a greyish colour. This, when collected, is washed with water saturated with carbonic acid, and, being allowed to dry in the sun, is afterwards reduced to a fine powder. It is then put into a matrass, and boiled in alcohol for about two hours, and filtered. The residue is treated with a fresh quantity of alcohol, and the same method is pursued.

These spirituous solutions are mixed, and the whole put into a glass retort, which is then placed in a sand-bath, and the alcohol distilled off; just as the liquid in the retort is observed to thicken, it is to be immediately

poured off into a pan, and allowed to remain undisturbed. In a short time a white pulverulent matter is precipitated, which attaches itself to the sides of the vessel. The supernatant liquor is to be poured off; the vessel is to be placed in a stove heated to about 25° R. When the new precipitate is sufficiently dry, it is to be collected and preserved in a glass jar. The liquid which was poured off being evaporated by a gentle heat, furnishes a solid substance, slightly deliquescent, and of a dark colour, which is the impure parigline. The *characters of parigline* are the following:—it is white, pulverulent, light, unalterable on exposure to atmospheric air, of a bitter austere taste, slightly astringent and nauseating, and of a peculiar odour. All the acids unite with it, forming various salts.

Dr. Palotta made five experiments with this medicine on himself; he began by taking two grains, and gradually increased the quantity to thirteen. From the effects it produced he has drawn the following conclusions:—That it has a sedative, but more particularly a diaphoretic property; that it excites an influence, principally on the lymphatic system, and that it will therefore answer all the indications of the sarsaparilla; that it may be used with great advantage in cases of chronic rheumatism; and in hepatic affections, as well as in those forms of disease, the effects of the syphilitic poison.*

Another experimentalist, Professor Folchi, contends, that the active principle of sarsaparilla resides in the medullary part of the root, and has extracted from it a yellowish-white substance, crystallized in acicular prisms, dissolving easily in cold water, nearly insoluble in alcohol, having little taste, and tinging green the syrup of violets. M. Folchi ranks it among the vegetable alkalis, under the name of *smilacine*.† Both Folchi's *smilacine* and Palotta's *parigline* are considered by Dr. Duncan as very problematical.

MEDICAL PROPERTIES AND USES.—Matthioli, we believe, was the first author who wrote on sarsaparilla as a remedy for syphilis; and the Spaniards were indebted to the Indians for their acquaintance with it. About the year 1563 it was introduced into Europe, as a cure for that disease. It quickly fell into disrepute, and was little employed, till it was brought into notice, during the last century, by Dr. William Hunter. Dr. Cullen allows but eight lines to its history and qualities; and, as he never found it effectual in any disease, he states, that he would not give it a place in the *materia medica*. Cullen has many converts to his opinion of it in the present day; and since it has been ascertained that many forms of venereal disease get well without the employment either of sarsaparilla or mercury, it is easy to assume that it is altogether worthless. Its more evident properties seem to be those of a mild stimulant and diaphoretic; but, if it be useless as an anti-syphilitic, we are inclined to think that few medical men are really so sceptical of its powers as to neglect its aid, after the disease has made its ravages in their own constitutions. Sir William Fordyce recommended it more particularly as an auxiliary to mercury, and to purify the system after its continued administration. Mr. Pearson (who told us, shortly before his death, that in making the decoction it was never sufficiently boiled, in opposition to the opinions of

* *Journal de Pharmacie*, x. p. 543.

† *Journ. de Chimie Médicale*, vol. i. p. 215.

others) says, "the contagious matter, and the mineral specific, may jointly produce, in certain habits of body, a new series of symptoms, which, strictly speaking, are not venereal: which cannot be cured by mercury, and which are sometimes more to be dreaded than the simple and natural effects of the venereal virus. Some of the most formidable of these appearances may be removed by sarsaparilla, the venereal virus still remaining in the system; and, when the force of the poison has been completely subdued by mercury, the same vegetable is also capable of freeing the patient from what may be called the sequelæ of a mercurial course." Dr. Good says, "I have chiefly found it succeed in chronic cases, when the constitution has been broken down, perhaps, equally beneath a long domination of the disease, and a protracted, and apparently inefficient, mercurial process. In connexion with a milk diet and country air, and with a total abandonment of mercury, I have found it of essential importance, and have seen an incipient hectic fall before a free use of it in a week. Its best form is the old one of the decoction of the woods." A late writer, Mr. Bacot, whose admirable treatise on syphilis we have read with much satisfaction, thinks very highly of sarsaparilla; and at page 278 of his work narrates the case of a man affected with gummata and nodes, (in whom mercury produced colliquative sweats, loss of appetite, and rapid waste of flesh,) attacked by nocturnal pains, so severe, that no language could be too strong to express his sufferings. Opium afforded no relief. A pint of the simple decoction of sarsaparilla was given each day, uninterruptedly, for five weeks, accompanied by no other medicines; and, at the end of that time, all symptoms were removed, excepting a few flying pains. Dr. Good and Mr. Pearson appear to us to have formed a correct estimate of its powers in syphilis, and the majority of medical men coincide with them.

Sarsaparilla is also used in those affections of the stomach which appear to arise from its own morbid secretions; also in chronic rheumatism, scrofula, gout, elephantiasis, and some other cutaneous diseases. In that irritable state of constitution consequent to severe operations, or to long continued suppuration, we have seen it employed with evident success in Guy's Hospital, under the auspices of Sir A. Cooper. It increases the appetite, brings down the pulse, augments its tone, and, conjoined with milk, is both food and medicine.

OFF. PREP. — Decoctum Sarsaparillæ, L. E. D. Decoct. Sarsaparillæ, comp. D. Extractum Sarsaparillæ, L. Syrupus Sarsaparillæ, L. D.



AMANITA MUSCARIA.

Fly Amanita.

Class XXIV. CRYPTOGRAMIA.—Order IV. FUNGI, Lin.

Nat. Ord. FUNGI, Link. Grev.

GEN. CHAR. *Pileus* furnished with a stem and *volva*, and bearing on its inferior surface straight sporiferous *lamellæ*. Stem either with a ring-like veil, or naked.

SPEC. CHAR. Margin of the *pileus* striated, shining, warty, rarely naked; *warts* and *lamellæ* white; *volva* vanishing, scaly; *stipes* bulbous.

Syn.—*Agaricus rubens*. Scop. Fl. Carn. p. 416.

Agaricus pseudo-aurantiacus. Bull. Camp. t. 112.

Agaricus nobilis. Bolt. Fung. t. 46.

Agaricus imperialis. Batsch. p. 59; Fl. Dan. t. 1129.

Fungus bulbosus e volva erumpens, &c. Mich. Nov. Pl. Gen. p. 118. t. 78. f. 2.

Agaricus muscarius. Lin. Fl. Suec. 1235; Hall. Hist. 2375; Schæf. Fung. t. 27; Huds. Angl. 2. p. 612; With. Bot. Arr. ed. 6. 4. p. 234; Bolt. Fung. 1. t. 27; Sow. Fung. t. 286; De Cand. Syn. p. 42; Purt. Midl. Fl. v. 2. p. 630; v. 3. p. 200; Fries. Syst. Mycol. v. 1. p. 16.

Amanita muscaria. Pers. Syn. Fung. p. 253; Wahl. Fl. Lapp. p. 527; Lam. Dict. v. 1. p. 111; Gray's Nat. Arr. v. 1. p. 600; Hook. Scot. pt. 2. p. 19; Grev. Fl. Edin. p. 369; Ejus. Crypt. Fl. v. 1. t. 54.

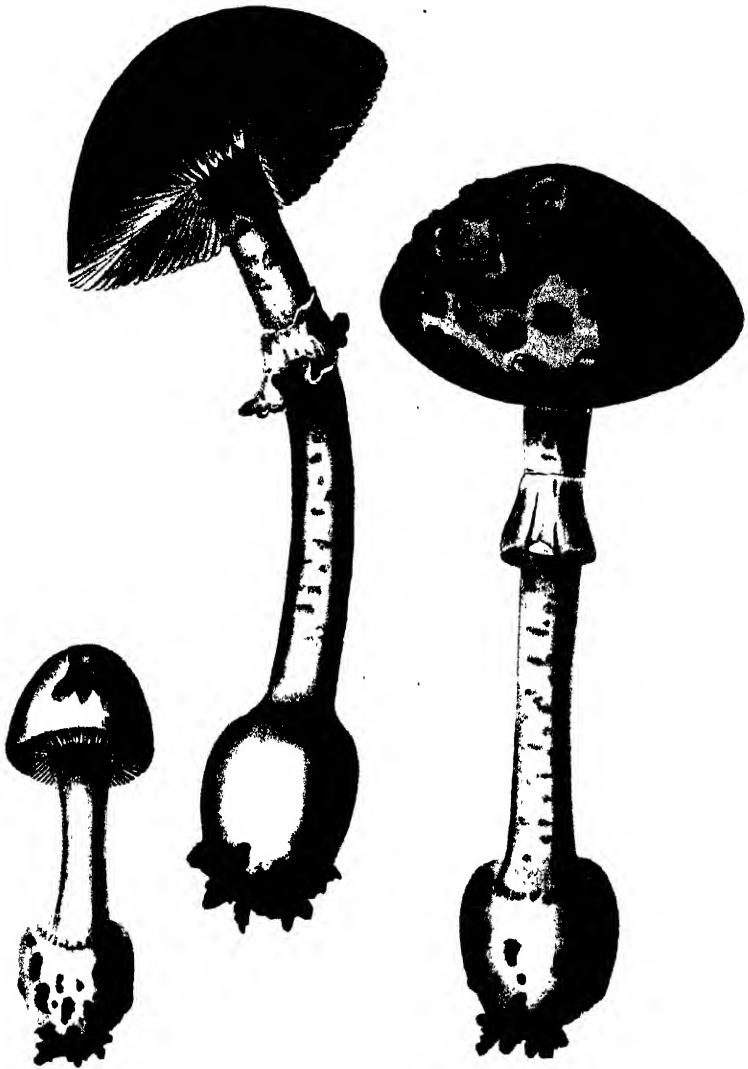
MANY species of this order are used as food, or rather as condiments; and several of them are known to rank among the most active of the vegetable poisons. Accidents arising from the poisonous Fungi being taken through mistake for the esculent mushrooms, are frequent both in this country and on the continent, especially in France, where many species are eaten that are rejected by us. Almost the only ones in use in this country are the *Agaricus campestris* and *oreades*, the *deliciosus*,

which the ancient Romans esteemed the greatest of luxuries, the truffle, and the morel. Even some of these, under certain circumstances, have proved injurious, if not poisonous; hence the greatest caution is necessary in selecting any species of this tribe for food. Haller informs us that the Russians eat the whole race, using the poisonous ones as means of intoxication. It appears, however, that these are used after a process of fermentation, so that their noxious effects are, probably, diminished. The poisonous species found in this country have not been correctly determined; those most commonly fatal are *Amanita muscaria*, and its varieties; the *Agaricus semiglobatus*, and *Agaricus globosus*.

The *Amanita muscaria* is one of the largest and most beautiful of the Agaric tribe, and really deserves the name of "imperial," applied to it by Batsch; "for the most indifferent person must be attracted by the glowing hues of its ample pileus, its regular form, tall pillar-like stipes—extremely conspicuous, even at a distance, in the shaded recesses of its native woods." It is found in woods throughout the whole kingdom, and is extremely abundant in the Highlands of Scotland.

The pileus is from three to six inches in diameter, convex at first, at length nearly flat, striated at the margin, varying very much in colour, being mostly bright red or orange, but sometimes liver-coloured, yellowish, or even whitish, and beset with downy, angular warts. The warts are white, or yellowish, prominent, pretty regular, scattered over the surface, but sometimes wanting. The lamellæ are flat, adnate with the stipes, very numerous, broad, and whitish. The flesh is thick, and white, partaking to a small depth of the colour of the pileus. The stipes is cylindrical, smooth, white, very straight, subsolid, from four to eight inches high, and bulbous at the base. The volva, according to Dr. Greville, is perfect only in extremely young plants, cracking immediately into pyramidal warts, which become less elevated, and more distinct, as the pileus expands, and generally leave a few traces upon the bulb, at the base of the stem.

PLATE CLXIV. exhibits three of the most striking varieties.



Amanita muscaria, var.



Agaricus semialobatus.

AGARICUS SEMIGLOBATUS.

Hemispherical glutinous Agaric.

Class XXIV. CRYPTOGRAMIA.—Order IV. FUNGI, Lin.
Nat. Ord. FUNGI, Link. series V. Tribe XXXII. PSALLIOTA,
Fries.

GEN. CHAR. *Pileus* furnished with a *stipes*, or fixed by its side, bearing on the under surface straight, simple, sporiferous *lamellæ*. *Volva* none.

SPEC. CHAR. *Pileus* hemispherical, smooth, glutinous, reddish, or greenish-yellow. *Lamellæ* fixed horizontally to the *stipes*, mottled with black. *Stipes* hollow, glabrous; ring indistinct.

Syn.—Fungus minor ex albedo subluteus pileo hemispherico. Raii Hist. 2. p. 97. t. 5.

Agaricus glutinosus. Curt. Fl. Lond. v. 2. t. 144.

Agaricus nitens. Bull. Champ. t. 566.

Agaricus præcox. Schum. Fl. Scell. p. 315.

Agaricus virosus. Sow. Fung. t. 407. f. 3. 4. 5. et. t. 408. f. 12. 13. 14; Pursh. Midl. Fl. v. 2. p. 646.

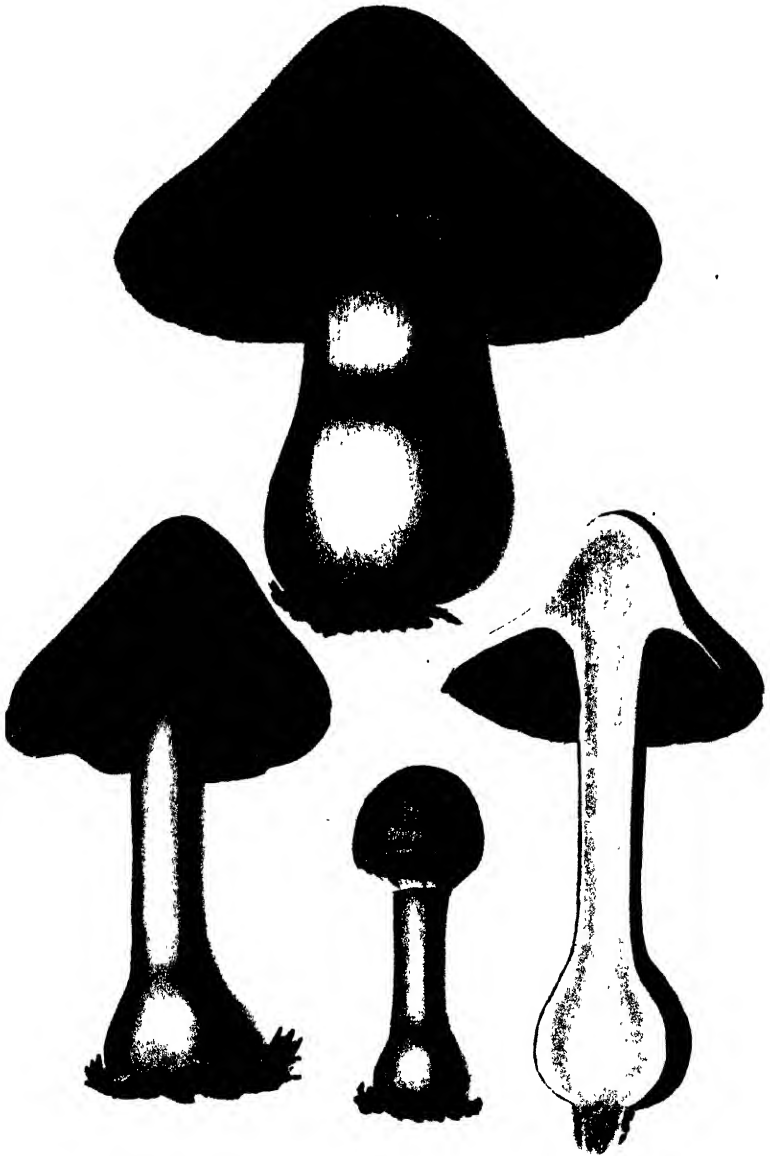
Agaricus semiglobatus. Batsch. Fung. p. 141. t. 21. f. 110. Sow. Fung. t. 248; Pers. Syn. Fung. p. 407. Wuth. Bot. Arr. v. 4. p. 333; Hook. Scot. pt. 2. p. 23. Grev. Fl. Edin. p. 391.; Crypt. Fl. v. 6. t. 344; Fries. Syst. Myc. v. 1. p. 391.

THE genus, *Agaricus*, is believed to contain upwards of a thousand different species. Sprengel enumerates only six hundred and forty-six; but this is much below the real number, as referred to by other authors. The *A. semiglobatus* is one of the most common, and, if Messrs. Brande and Sowerby's account be correct, the most deleterious of the tribe. It occurs in most parts of the kingdom, in exposed and elevated pastures, moist meadows and woods, from May to September. Dr. Greville says, it is extremely common in Scotland; and Mr. Curtis found it in great abundance about Peckham, Hornsey, and other places near London.

It generally grows singly, but sometimes springs up in clusters, especially on dunghills, or on those spots where dung has been thrown. The stipes, or stem, is from three to six inches in height, and two or three lines in diameter, pale yellowish, hollow, the tube being very small, and sometimes partly filled with a white pith; more or less crooked, somewhat incrassated towards the base, glutinous, furnished with a ring, and mostly dotted with black immediately beneath the pileus. The pileus is from half an inch to an inch and a half in breadth, of a pale reddish-orange, or straw-colour, in the full grown ones exactly hemispherical, rarely becoming in large specimens plano-convex, very glutinous, and smooth, hence the name *glutinosus* given to it by Curtis. The usual colour of the cap is reddish-orange, but when wet with rain it becomes browner and transparent, so that it sometimes appears as if striated. The flesh is thin and white. The lamellæ are numerous, fixed, horizontal, extending in a right line, or nearly so, from the margin of the pileus to the stipes, and beautifully mottled with the purplish black sporidia.

With regard to this species, it may not be improper to remark, that the poisonous qualities usually ascribed to it, are still somewhat problematical. Mr. Sowerby states, that it was the variety marked No. 1 on our *B. te*, which nearly proved fatal to a poor family in London, who were so indiscreet as to stew a quantity of it, gathered in Hyde Park, for breakfast. We cannot help thinking, however, with Dr. Greville, that the plant, with the acuminate pileus, is a distinct species from the other figures on the same plate.

“*Agaricus*, which gives name to this type and section, includes now more known species of fungi than any other genus. *Boletus*, however, seems to have been formerly the more comprehensive term, signifying almost any field mushroom or toadstool; while *Agaricus* was peculiarly applied to the Sarmatian fungi, which are said to have chiefly, if not exclusively, grown on trees. Thus the ancient *Boletus*, ‘*Fungorum princeps et dominus*,’ is the present *Agaricus cæsaræus*, and the *Dædalea quercina* is still called the agaric of the oak. Hence, although *Agaricus* gives its name to the section, *Boletus*, as of right, denominates the order.—*Vide Burnett's Outlines of Botany*, vol. i. p. 253.



AGARICUS BULBOSUS.

*Bulbous stemmed Agaric.**Class XXIV. CRYPTOGRAMIA.—Order IV. FUNGI, Lin.**Nat. Ord. FUNGI, Link. GYMNOCARPI, Pers.*

SPEC. CHAR. *Pileus* obtusely umbonate, smooth, tawny, when dry testaceous. *Lamellæ* cinnamon coloured. *Stem* very thick, bulbous; veil white.

Syn.—*Amanita*. n. 2445. *Hall. Hist.* v. 3, p. 174.

Cortinaria bulbosa. *Gray's Nat. Arr.* v. 1. p. 630.

Agaricus bulbosus. *Sow. Fung.* t. 130; *Purt. Midl. Fl.* 2. 636; *Pers. Syn. Fung.* p. 195; *Fries. Syst. Mycol.* 1. p. 214.

ONE of the common poisonous native Agarics, abounding in woods in the autumnal months. It has a pungent odour, resembling that of horse-radish. The pileus is two or three inches broad, bright brown, or chestnut coloured, obtusely umbonate, thin at the margin, testaceous when dry, and brittle. The lamellæ are cinnamon-coloured, or tawny, three or four in a set, distant, and three or four lines broad, with rose-coloured sporidia. The stem is about four inches in height, solid, very thick, dullish red, bulbous, ovate, and in old specimens ferruginous at the base. The veil is annular, whitish, and fugacious. Withering's *A. bulbosus*, (*Bot. Arr.* v. 4. p. 271,) is a different plant.

On the continent a great many kinds of Fungi are used for culinary purposes. In this country very few are regarded by epicures as edible; but Dr. Greville* enumerates no fewer than twenty-six species, which grow abundantly in most parts of Britain, that may be eaten with safety. They are the following:—*Tuber cibarium*, or common Truffle; *T. moschatum*, and *T. album*, two analogous

* *Memoirs of the Wernerian Natural History Society*, v. iv. p. 399.

species *Amanita cæsarea* and *aurantiaca*, the *Oronge* of the French, which is often confounded with *A. muscaria*, but may be distinguished from it by the colour of the gills, which in the former species are yellow; *Agaricus procerus*, *campestris*, *oreades*, *odorus*, *eburneus*, *ulmarius*, *ostreatus*, *violaceus*, *piperatus*, *acris*, and *deliciosus*; *Cantharellus cibarius*; *Boletus edulis*, *scaber*: *Fistulina hepatica*; *Hydnum repandum*; *Clavaria coralloides*, *cinerea*; *Morchella esculenta*; *Helvella mitra* and *leucophea*. Some of these, however, especially *piperatus* and *acris*, have been deemed unwholesome.

M. Orfila, in his "*Toxicologie Générale*," mentions the following species as decidedly poisonous: *Amanita*, *muscaria*, *alba*, *citrina*, and *viridis*; the *Hypophyllum maculatum*, *albocitrinum*, *tricuspidatum*, *sanguineum*, *cruæ-militense*, *pudibundum*, and *pellitum*; the *Agaricus necator*, *acris*, *piperatus*, *pyrogalus*, *stipiticus*, *annularis*, and *urens*. To these may be added the *A. semiglobatus*, *bulbosus*, and probably many others.

"The *A. cæsarea* is a fungus possessed of some classic fame; it has been celebrated both by Juvenal and Martial; not so much, however, for its beauty, as for the traditional belief that it was in a dish of these mushrooms, which by the ancient Romans were considered the greatest luxuries of the table, that Agrippina administered poison to her husband, Claudius Cæsar, to hasten her son's accession to the throne. Hence, probably, it derived its specific name *Cæsarea*; but Nero, for whose sake Claudius had been poisoned, called it the *food for gods*, because, after his death, Claudius was numbered amongst the Roman deities.

"It appears from Pliny, that, after the murder of Claudius, mushrooms fell into unmerited disrepute. He says, 'Among all those things which are eaten with danger, I take it that mushrooms may be justly ranged in the first and principal place: true it is that they have a most pleasant and delicate taste; but discredited much they are, and brought into an ill name, by occasion of the poison which Agrippina, the empress, conveyed unto her husband the emperor by their means: a dangerous precedent given for the like practice afterwards.' (*Holland's Trans.*) The *A. cæsarea* has, however, through the lapse of time, again recovered its reputation, for now it is commonly seen in the Italian markets: in Italy it is abundant, but in these kingdoms rare. It is liable to be mistaken for a poisonous species belonging to the same subgenus, but may easily be distinguished by its yellow gills from the *A. imperialis*, in which they are always white."—*Vide Burnett's Outlines of Botany*, vol. i. p. 260.

In the selection of unknown Fungi, colour has been regarded by many writers as of considerable importance. "*Quamobrem recte scribit Avicenna*," says Matthioli, "*eos noscentes esse, qui nigri vel virides, vel in*

nigro-purpurascetes visuntur." Persoon remarks, that a pure yellow, or golden colour, especially in the lamellæ of Agarics, denotes a good quality. Dr. Greville says, many excellent species have a very pale, or nearly white pileus; but that some are brown. A vinous red, and violet, is regarded as universally wholesome; but orange red, and rose-colour, poisonous. According to Decandolle, all the Boleti are edible, except, 1st, coriaceous and ligneous species; 2nd, those whose stem is furnished with a collar, or annular veil; 3rd, those with an acrid taste; and 4th, those whose flesh turns to a blue colour on being cut. Whenever this last character is perceived in any plant of this order, it always denotes a poisonous property. All those species that have a pungent, or disagreeable smell, an astringent taste, or leave an unpleasant sensation on the tongue and palate, should be entirely rejected. Agarics growing in tufts and clusters from the trunks of trees, are almost universally to be avoided. "Fungi, especially Agarici and Boleti, should be gathered for the table before they arrive at their full age, as they frequently then become tough and insipid. The *hymenium*, or that part containing the fructification, should, when it consists of tubes, (as in the Boleti,) be invariably removed, as it is often noxious, when the rest of the plant is unexceptionable. When the hymenium consists of gills or lamellæ, (as in Agaricus and Amanita,) they need not be separated, if the plant be taken when quite young; but if the pileus or cap, be expanded, they must be removed before cooking." Many species that are innocent when the plant grows on dry ground, are deleterious when it grows in a wet situation. The same species may be eaten with impunity when young, but becomes noxious when old. In some constitutions, even the common esculent kinds prove deleterious, as evinced by their not unfrequent effects on one of a party, while the rest escape.

QUALITIES AND CHEMICAL PROPERTIES.—Mushrooms are of rapid growth and speedy decay. When they putrefy, they give out an extremely unpleasant odour, and approach animal matter more closely than other vegetable substances. Braconnot, who, with M. Vauquelin, has analyzed a great number of species, distinguished the insoluble spongy portion, which characterises mushrooms by the name of *fungin*. It approaches woody fibre in its properties; but is sufficiently distinguishable by various characters, particularly by constituting a nourishing article of food, and being much less soluble in alkaline leys. Braconnot also ascertained the existence of two new acids in mushrooms. One of these is termed *boletic acid*, and consists of irregular four-sided prisms, of a white colour, and permanent in the air: the other acid, which constitutes a very general ingredient in mushrooms, is called *fungic acid*. Both may be obtained from the expressed juice of the *Boletus pseudo ignarius*, the latter also from *B. juglandis*, *Merulius cantharellus*, *Peziza nigra*, and *Phallus impudicus*. Proust has likewise discovered in them the benzoic acid, and phosphate of lime.

AMANITA muscaria. This was examined by Vauquelin, who extracted from it an animal matter, insoluble in alcohol, osmazome, a fatty matter, muriate, phosphate, and sulphate of potash.

AGARICUS bulbosus. Vauquelin obtained from this species the two animal matters found in the *Amanita muscaria*, a fatty soft matter, of a yellow colour and acrid taste, and an acid salt, which is not a phosphate.

The insoluble substance of this, and of the former species, yielded an acid when distilled.*

We have met with no analysis of the *Agaricus semiglobatus*.

POISONOUS EFFECTS.—The symptoms which generally arise from eating the noxious Fungi, are pains of the stomach, nausea, vomiting, and purging; sense of heat of the bowels, faintings, cramps of the lower extremities, convulsions, sometimes general, sometimes partial, and unquenchable thirst succeed: the pulse is small, hard, and very frequent. When these symptoms, after having continued a certain time, do not diminish in consequence of the remedies administered, vertigo, stupor, and delirium, affect some subjects, and are only interrupted by pains and convulsions. In others there is no drowsiness; the pains and convulsions exhaust the strength, faintings and cold sweats come on, and death puts a period to this series of suffering, after having been foreseen and announced by the patient himself, who has not lost his senses for a single moment.

Poisonous Fungi do not in general manifest their action till six or eight hours after they are eaten, and twelve or sixteen occasionally elapse. In cows and other cattle, they have been known to produce bloody urine, nauseous milk, swellings of the abdomen, inflammation of the intestines, obstructions, diarrhoeas and death. In sheep, they are said to bring on a scirrhus liver, a cough, general wasting, and dropsy.

1. *Amanita muscaria*. In the *Toxicologie Générale* of M. Orfila, several cases are detailed of the fatal effect of this species on the animal economy. Several French soldiers ate, at two leagues from Polosk, in Russia, mushrooms of the above kind. Four of them, of a robust constitution, who considered themselves proof against the consequences under which their feebler companions were beginning to suffer, refused obstinately to take an emetic. In the evening the following symptoms appeared: anxiety, sense of suffocation, ardent thirst, intense griping pains, a small and irregular pulse, universal cold sweats, changed expression of countenance, violet tint of the nose and lips, general trembling, foetid evacuations. These symptoms becoming worse, they were carried to the hospital. Coldness and livid colour of the limbs, a dreadful delirium, and acute pains accompanied them to the last moment. One of them sunk a few hours after his admission into the hospital; the three others had the same fate in the course of the night. Haller relates that six persons of Lithuania perished at one time by eating the *A. muscaria*; and that in Kamtschatka it had driven others raving mad. The inhabitants of the latter country prepare a liquor from it, and from a species of *Epilobium*, which, taken in small quantities, inebriates. It has not, however, been clearly ascertained whether the species which grows in this country, and in the south of Europe, be the same as that which is found in Kamtschatka. The properties of this variety are exceedingly curious, and have been fully described in an Essay by Dr. Langsdorf,† quoted by Dr. Greville. The inhabitants of the north-eastern parts of Asia use it in the same manner as ardent spirits, or wine, to produce intoxication. These fungi are collected in the hottest months, and hung up by a string in the air to dry; some dry of themselves on the ground, and are said to be far

* *Ann. de Chim.* lxxxv.

† *Annalen der Wetterauischen Gesellschaft für die gesammte Naturkunde.*

more narcotic than those artificially preserved. Small deep-coloured specimens, thickly covered with warts, are also said to be more powerful than those of a larger size and paler colour.

The usual mode of taking this fungus is to roll it up like a bolus, and swallow it without chewing, which the Kamschatdales say, would disorder the stomach. It is sometimes eaten fresh in soups and sauces, and then loses much of its intoxicating property; when steeped in the juice of the berries of *Vaccinium uliginosum*, its effects are those of strong wine. One large, or two small fungi, is a common dose to produce a pleasant intoxication for a whole day, particularly if water be drank after it, which augments the narcotic principle. The desired effect comes on one or two hours after taking the fungus. Giddiness and drunkenness result from the fungus, in the same manner as from wine or spirits. Cheerful emotions of the mind are first produced, involuntary words and actions follow, and sometimes at last an entire loss of consciousness. It renders some remarkably active, and proves highly stimulant to muscular exertion; with too large a dose, violent spasmodic effects are produced.

So very exciting to the nervous system, in some individuals, is this fungus, that the effects are often very ludicrous. If a person under its influence wishes to step over a straw, or small stick, he takes a stride or a jump sufficient to clear the trunk of a tree; a talkative person cannot keep secrets or silence; and one fond of music is perpetually singing.

The most singular effect of the *Amanita* is the influence it possesses over the urine. It is said that from time immemorial, the inhabitants have known that the fungus imparts an intoxicating quality to that secretion, which continues for a considerable time after taking it. For instance, a man moderately intoxicated to-day, will by the next morning have slept himself sober; but (as is the custom) by taking a tea-cup full of his urine, he will be more powerfully intoxicated than he was the preceding day by the fungus. The intoxicating property of the fungus is capable of being propagated; for every one who partakes of it has his urine similarly affected. Thus, with a very few *Amanitas*, a party of drunkards may keep up their debauch for a week. Dr. Langsdorf mentions, that by means of the second person taking the urine of the first, the third that of the second, and so on, the intoxication may be propagated through five individuals.

Linneus says, that flies are killed by this fungus, when infused in milk, hence its name *muscarius*; and the same author also tells that the expressed juice, rubbed on walls and bedsteads, effectually expels bugs. In the north of Europe, it is sometimes administered in doses of from ten to thirty grains, by the vulgar, in epilepsy, palsy, and as an application to foul ulcers. More recently a tincture of it has been employed internally by M. Reinhard, for scaly affections of the skin, and in obstinate expectorations, both mucous and purulent. The dose is from thirty to forty drops in any proper vehicle.*

2. *Agaricus semiglobatus*. In vol. iii. of the "London Medical and Physical Journal," cases are detailed by Mr. E. Brande, in which the species was partaken of by several individuals of one family, all of whom were saved by energetic and well-directed treatment. In vol. xx. of the same work, is the subjoined account, by Mr. Parrott, of Mitcham, in which

it will be seen that death occurred from eating this fungus in three instances, and very alarming symptoms were produced in others.

"The family, which partook of this poison, consisted of William Attwood, aged 45 years; Eliza, his wife, 38; their daughters, viz. Mary, 14, Hannah, 11, Sarah, 7, Eliza, 6.

"On Monday, the 10th inst. 1808, all ate stewed champignons, at one o'clock, which stew was made in an iron vessel, and consisted of the articles already specified, with the addition of butter, flower, pepper, salt, and water. Each of these parties, Hannah excepted, was supposed to have eaten more than half a pint. Within ten minutes after they had eaten their meal, they felt their spirits exhilarated, and the eldest daughter said to her mother, 'How funny you look!' All the parties continued cheerful till about six o'clock, when, having taken their tea, they were attacked with stupor, which was not of long continuance; this was soon succeeded by severe pains in the bowels, accompanied with violent vomiting, and copious purging, which continued till the following afternoon, when the patients were alarmed, and requested my attendance. Under these symptoms, it appeared that the first step to be taken, was to get rid of the poison; for which purpose, oily opening medicines were administered, with emollient clysters, and plentiful dilution with warm broth was recommended. This method of treatment appeared to promise success in the case of Mary, who had so far recovered on the following day, Wednesday, that she walked about a quarter of a mile from home; in the evening, however, the symptoms returned. On Thursday evening she became convulsed, and died on Friday morning at two o'clock.

"Hannah only ate two spoonsful of the stew, as she did not like its flavour; this girl recovered after a severe vomiting and purging.

"Eliza did not complain much of her sufferings, but became convulsed at the same time her sister Mary did, and died half an hour after her.

"Sarah never complained of pain in the head, but was continually suffering under extreme pain in the bowels, which was increased on pressure, but no tension existed. Clysters afforded her no relief, and she died on Saturday morning in the same convulsed state as her sisters. Permission having been obtained to open one of the bodies, that of Sarah was examined, as she had suffered under the most excruciating pain in the bowels, but no appearance of disease was manifest in any of the abdominal viscera; the stomach was empty, and also the whole of the alimentary canal. On Friday, the 14th, the vomiting still continuing in the father and mother, it was thought proper to administer small doses of opium,* but without effect; the effervescing draught was then given, which succeeded, but the pain in the bowels was thereby so much increased, that both regretted having taken it. On the same night Mrs. Attwood miscarried—she was two months advanced in pregnancy; but, with her husband, is now in a state of convalescence. During the progress of this unfortunate occurrence, the pulse in each of the patients was quickened, and varied from 100 to 120 in a minute, but was not sufficiently full to justify the use of the lancet; the tongue was parched, and slightly streaked with white; the tuniçæ conjunctivæ were not inflamed, and the parties

* "In our opinions, considerable doses of solid opium should have been given long before this."—EDITORS.

were all perfectly sensible ; the urine was secreted in very small quantity, but it was not high coloured.

" A dog which had partaken of the stew died on Wednesday night, apparently in great agonies."

3. *Agaricus bulbosus*.—In vol. xii. of the London Medical and Physiological Journal, pages 387 and 512, Dr. Bardsley, of Manchester, narrates several cases in which very severe effects were produced by a fungus, which, according to Dr. Hull, was the *Agaricus bulbosus*.

" On the 29th of October, 1804," says Dr. B. " I was called upon at six in the evening to visit Master S., aged 5 years, the son of a gentleman living near this town. His parents informed me that he went out to play in perfect health, after eating a moderate dinner, with a companion of nearly his own age, in the fields adjoining ; and in about two hours was led home in a state of alarming illness. He seemed to stagger like a person intoxicated, and with odd gesticulations laboured to express his sufferings, but was unable to articulate a single syllable. When I saw the patient, which was probably about two hours after the seizure, he appeared partially delirious, and uttered faint and indistinct screams. His pulse was slow and somewhat irregular. The pupils of both eyes were much dilated, and vision was evidently imperfect. He seemed very averse to lying down, and his restlessness and impatience led him to make frequent attempts to walk about the room, but without any fixed object or design. He was unable to answer any questions, or to express his feelings by words. Slight convulsive motions might be perceived in the legs and arms, which gradually extended to the muscles of the trunk, and produced irregular distortions of the whole body. The upper extremities began to swell, and assumed a livid colour ; the abdomen felt hard and tumid." From the symptoms Dr. B. suspected the cause, but could not ascertain the fact at the time. Frictions, with the volatile liniment, were applied to the spine, and a stimulating enema administered. He was put into a hot bath at 100°, and kept in for ten minutes. The clyster was soon repeated, and purgative pills, composed of calomel and extract of jalap. Profuse sweating ensued, and was maintained by diluents of lemon whey, &c. A copious stool took place twenty minutes after the last clyster, and the patient, who was tranquillized by the bath, became much better. Soon after, he vomited an offensive greenish-coloured fluid, and this was succeeded by a plentiful discharge from the bowels, but no vestiges of the fungus could be discovered in the dejections. An evident abatement of symptoms followed, the dilatation of pupils disappeared, the pulse became slower and firmer, he articulated with tolerable distinctness, but seemed like a person just roused from a long and deep sleep, unconscious of any thing that had happened. The bowels were kept in action during the night ; and the next day, with the exception of debility and languor, the patient had recovered.

Upon strictly questioning him and his companion, it appeared that they had eaten some fungi while in the fields, but the latter partook of so little that his symptoms were very mild. Dr. Bardsley further remarks, that had he been called at an earlier period, he should have ordered an emetic, but supposing that a sufficient time had elapsed for the poison to have passed into the bowels, he directed his efforts to procure a plentiful evacuation from them.

MORBID APPEARANCES.—The appearances observed on dissection

are violet coloured spots on the skin over the whole body, very extensive and numerous; the abdomen is extremely bulky, the conjunctiva is injected, the pupil contracted, the stomach and intestines inflamed, and scattered over with gangrenous spots; sphacelus is present in some portions of this viscus, and the stomach and intestines are so contracted, that the canal of the latter is often obliterated. The œsophagus in one subject was inflamed and gangrenous; and in another there was *intussusceptio* of the ileon. One individual alone has been known to have the intestines distended with excrementitious matter. *In none have the remains of the mushroom been found*; they had either been completely digested or evacuated. The lungs were inflamed and distended with black blood; congestion had also taken place in almost all the veins of the abdominal viscera, in the liver, spleen, and mesentery. Inflammation and gangrenous spots occur on the membranes of the brain, in its ventricles; on the pleura, lungs, diaphragm, mesentery, bladder, uterus, and were even observed on the fœtus of a pregnant woman. The blood in this subject was extremely fluid; in others, it was almost coagulated. Extreme flexibility of the limbs was not a constant appearance.

TREATMENT.—Although the fungi have generally passed the stomach prior to the manifestation of alarming symptoms, it will be right to excite vomiting as speedily as possible, by a solution of sulphate of zinc or copper; evacuations from the bowels should be immediately produced by stimulating purgative clysters; and as soon as the stomach becomes settled, the intestines should be thoroughly emptied by means of castor or croton oil; perhaps a large dose of spirits of turpentine would be better than either. After the first evacuation, small, but repeated doses of ether, or ether and opium, should be given in almond emulsion; and water acidulated with vinegar, or other vegetable acids, may form the common drink. Other symptoms, subsequent to the effects of these poisons, must of course be treated according to the general principles which will suggest themselves to every well-informed practitioner.



RHUS TOXICODENDRON.

*Trailing Sumach. Pubescent Poison Oak.**Class V. PENTANDRIA.—Order III. TRIGYNIA.**Nat. Ord. DUMOSÆ, Lin. TEREBINACEÆ, Juss.**TEREBINTHACEÆ, De Cand.***GEN. CHAR.** *Calyx* 5-parted. *Petals* 5. *Berry* superior, with one seed.**SPEC. CHAR.** *Leaves* ternate; leaflets petioled, ovate, sinuated, angular, pubescent underneath. *Stem* creeping.*Syn.*—*Hedera trifolia virginiensis.* *Park. Theatr.* 679. 5.*Arbor trifolia venenata virginiana, folio hirsuto.* *Raii. Hist.* 1799.*Edera trifolia canadensis.* *Cornut. Canad.* 96. t. 97; *Barr. Ic.* 228.*Vitis canadensis.* *Munting. Phyt.* p. 239. t. 60.*Rhus radicans.* *Willd. Sp. Pl.* 1. p. 1481; *Hort. Kew.* 2. p. 163; *Kalm. Trav.* v. 1. 67. 177.*Toxicodendron triphyllum glabrum.* *Duham. Arb.* v. 2. 341. t. 98.*Rhus toxicodendron.* *Lin. Sp. Pl.* 381; *Willd.* 1. 1481; *Hort. Kew.* 2. p. 82; *Pursh. Fl. Amer. Sept.* 205; *Mich. Bor. Am.* 1. p. 183; *Stokes Bot. Mat. Med.* 2. 160; *Bot. Mag.* v. 43. t. 1806.*FOREIGN.*—*Toxicodendron*; *Herbe à la puce*, Fr.; *Rus Tossicodendro*, It.; *Giftsumach*, Ger.

THE Trailing Sumach, or Poison Oak, as it is sometimes improperly called, is a common tree in woods, fields, and hedges in North America, from Canada to Georgia; flowering in June and July. It is assumed by many botanists that this is a distinct species from the *Rhus radicans*. Linneus is of this opinion, and founds his distinction on the leaves of the latter being naked and entire, while they are pubescent and angular in the former. Michaux and Pursh, who had more extensive opportunities for observation, consider the two as mere local varieties, while Elliot and Nuttall agree in opinion with Linneus. We consider, however, that the question in favour of their identity has been set at rest by Professor Bigelow, who

states, "among the plants which grow abundantly round Boston, I have frequently observed individual shoots from the same stock having the characters of both varieties. I have also observed, that young plants of *Rhus radicans* frequently do not put out rooting fibres until they are several years old, and that they seem, in this respect, to be considerably influenced by the contiguity of supporting objects." The drawing was taken from a plant in the garden of the Society of Apothecaries, Chelsea.

The root sends up many stems, which divide into slender, woody branches, and are covered with a brown bark. These stems seldom grow erect, but trail along the ground, and when they meet with support will ascend a wall, or climb like ivy to the tops of the loftiest trees. The leaves are placed alternately, supported on long petioles; and are composed of three dark green, shining leaflets, about three inches long and one and a half broad. The leaflets are of an ovate, or rhomboidal form, pointed, strongly veined, smooth on the upper surface, but always more or less downy beneath, at least about the ribs, and sometimes quite covered with down at the back, their margin almost entire, but most generally, in the downy variety, strongly sinuated, cut, or lobed: the two lateral leaflets are considerably the smallest of the three, and nearly sessile. The flowers are produced in simple axillary racemes on short peduncles, and are of an herbaceous colour, and sometimes dicecious. The calyx is divided into five deep, erect, permanent segments. The petals are also five, ovate, pointed, and spreading. The filaments are five, shorter than the corolla, bearing small roundish anthers. The germen is superior, roundish, supporting a very short style with three small heart-shaped stigmas. The fruit is a globular striated, whitish berry, containing a single, roundish, bony seed. Fig. (a) exhibits a flower a little magnified; (b) the calyx; (c) the germen and style; (d) the fruit; (e) a leaf in outline, to show the pubescence on the under surface.

QUALITIES AND CHEMICAL PROPERTIES.—"If a leaf or stem of this plant be broken off," says Prof. Bigelow, "a yellowish milky juice immediately exudes from the wounded extre-

mity. After a short exposure to the air, it becomes of a black colour, and does not again change. This juice, applied to linen, forms one of the most perfect kinds of indelible ink. It does not fade from age, washing, or exposure to common chemical agents. I have repeatedly, when in the country, marked my wristband with spots of this juice. The stain was at first faint and hardly perceptible, but in fifteen minutes became black, and was never afterwards eradicated by washing, but continued to grow darker, as long as the linen lasted."

Dr. J. Horsefield, in a valuable dissertation on the American species of *Rhus*, states various unsuccessful experiments he made with a view to ascertain the nature of this colouring principle, and the means of fixing it on stuffs. He found that the juice expressed from the pounded leaves did not produce the black colour, and that strong decoctions of the plant, impregnated with various chemical mordants, produced nothing more than a dull yellow, brownish, or fawn colour. The reason of this is, that the colouring principle does not reside in the sap, but in the *succus proprius*, or in the peculiar juice of the plant, which is secreted in small quantity, and is wholly insoluble in water,—a circumstance which contributes to the permanency of its colour, at the same time that it renders some other medium necessary for its solution.

With a view to ascertain the proper menstruum, Dr. Bigelow subjected pieces of cloth stained with it, to the action of various chemical agents. Water, at various temperatures, assisted by soap and alkali, produced no change in its colour. Alcohol, both cold and boiling, was equally ineffectual. A portion of the cloth, digested several hours in cold ether, with occasional agitation, was hardly altered in appearance. Sulphuric acid reddened the spots, but scarcely rendered them fainter. The fumes of chlorine, which bleached vegetable leaves and bits of calico in the same vessel, excited no effect on this colour. Boiling ether is the proper solvent of this juice. A piece of linen spotted with it, was immersed in ether, and placed over a lamp; as soon as the fluid boiled, the spot began to grow fainter, and in a few minutes was wholly discharged, the ether acquiring from it a

codendron, in which he asserts, that he gave the dried leaves of this plant in doses of half a grain, or a grain, three times a day, in several cases of paralysis. He says, that all his patients recovered, to a certain degree, the use of their limbs. The first symptom of amendment was an unpleasant feeling of prickling or twitching in the affected limbs; which appears analogous to the sensation produced by *Strychnine*. Subsequent experiments by no means confirm the good opinion which Dr. Alderson endeavoured to impress on the public; but we conceive that it is highly culpable to abandon a sufferer to his lamentable fate, without trying the efficacy of a medicine which can easily be obtained. We have always experienced the greatest facility in procuring specimens of plants from Mr. Anderson, of the Apothecaries garden at Chelsea; and feel assured that the Worshipful Company are well satisfied to have the profession supplied with small quantities of any of their productions, when they cannot be procured elsewhere.

Dr. Givensius has administered the leaves of this species of *Rhus*, in doses of one-fourth of a grain, twice a day, in five cases of paralysis, four of which were cured.”*

In persons not constitutionally susceptible to the eruptive disease, it is probably an inert medicine, as Dufrenoy's patients sometimes carried the dose as high as an ounce of the extract, three times a day, without perceiving any effect from it.

The external application of this family of plants might, no doubt, be used in certain cases as a stimulant, with great effect: indeed, Dr. Pierson, of the United States, was relieved from dyspeptic symptoms and chronic inflammation of the eyes, after having been powerfully affected by exhalations from the *Rhus vernix*. But as the effects would not be certain, nor manageable in extent, the prospect of benefit is scarcely sufficient to justify the risk of the evil.

* *Bulletin des Sciences Medicales*. Sept. 1825.



Sterocarpus erinaceus.

PTEROCARPUS ERINACEUS.

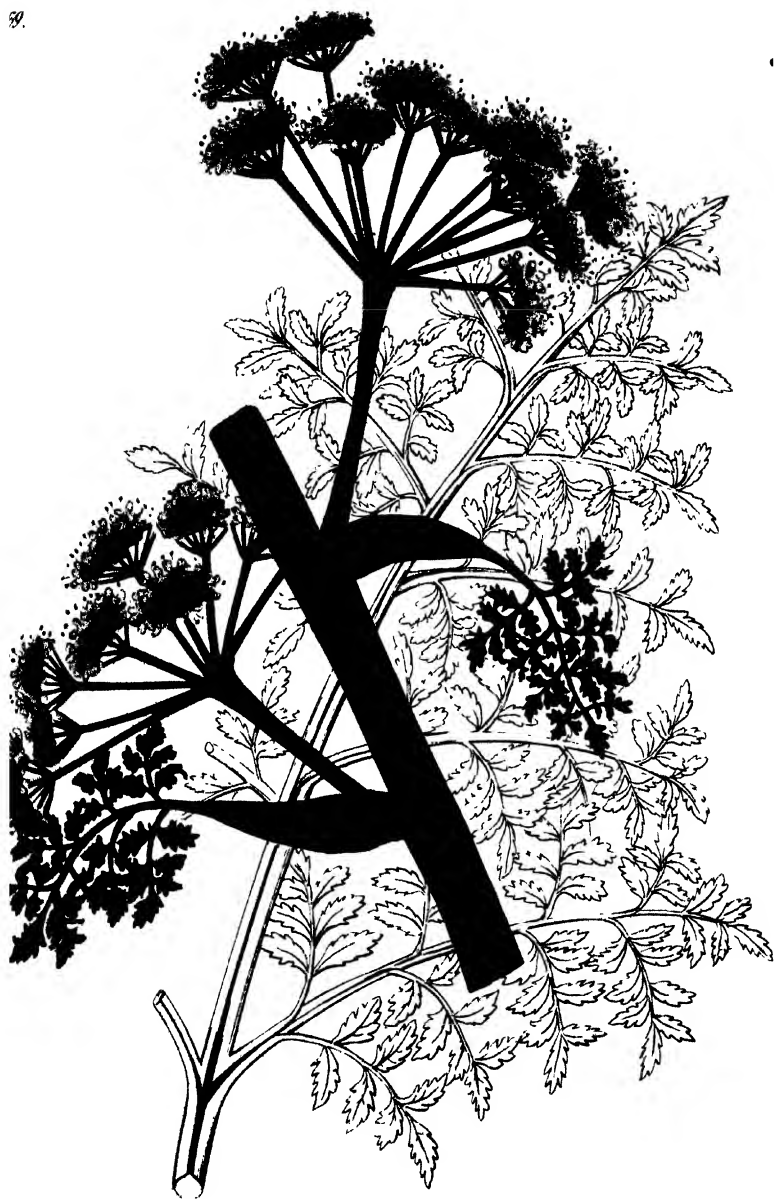
African Pterocarpus, or Kino Tree.

*Class XVII. DIADELPHIA.—Order IV. DECANDRIA.**Nat. Ord. PAPILIONACEÆ, Lin. LEGUMINOSÆ. Juss., De Cand.**GEN. CHAR. Calyx 5-toothed. Legume falcate, leafy, with tumid veins, bordered with a wing, not bursting. Seeds solitary.**SPEC. CHAR. Leaves pinnate; leaflets alternate, elliptical, obtuse, smooth above, reddish, pubescent underneath. Legume with a very short straight point.**Syn.—Pterocarpus senegalensis; foliis pinnatis, foliolis ovalibus fructibus lunato-orbiculatis, pubescentibus. Gray's Trav. p. 395. t. D.**Pterocarpus erinaceus. Lam. Dict. 5. p. 728; Illustr. t. 602. f. 4: De Cand. Prodr. part. 2. p. 419.*

It is well known that the plant which yields the *Kino* of the materia medica has been hitherto involved in much obscurity, and a great variety of opinions have been entertained, both among botanists and pharmacologists, respecting the tree which affords this useful extract. The Edinburgh college has inserted kino as the inspissated juice of the *Eucalyptus resinifera*, a native of New Holland, while the Dublin pharmacopœia has considered it as the product of the *Butea frondosa*, a native of the coast of Coromandel. It appears, however, that there is sold in the shops, under the appellation of kino, various substances, agreeing very nearly in their characters, both physical and chemical; but it is to Mr. Park, the celebrated traveller, that we are indebted for the discovery of the tree which yields the best kino of commerce; who, in his second expedition into Africa, found it in its native situation on the Gambia, and transmitted a dried specimen of the plant to Europe, which we believe is still preserved in the Banksian Herbarium. It is a *Pterocarpus*, a native of Senegal, and is described by Lamarck, under the specific

given, is principally the product of another species, the Pterocarpus *Draco* of Linneus.

Dragon's blood is a solid, resinous, concrete substance, of a dark red colour, which, when powdered, changes to crimson; it readily melts, and catches flame; is insipid, and has a slightly warm pungent taste. It was known to the ancient Greeks, by the name of cinnabar, the cinnabar of the moderns being in those ages called *minium*. In the time of Dioscorides it was employed as an astringent in hæmorrhages and alvine fluxes; but it probably has no such property, and has long since been discarded from medical practice.



Ferula persica:

FERULA PERSICA.

*Persian Fennel-Giant.**Class V. PENTANDRIA.—Order II. DIGYNIA.**Nat. Ord. UMBELLATÆ, Lin. UMBELLIFERÆ, Juss., De Cand.*

GEN. CHAR. *Fruit* oval, compressed, with three ribs on each side. *Calyx* obsolete. *General involucre*, deciduous. *Flowers* uniform, all fertile.

SPEC. CHAR. *Leaflets* many-cleft, acute, decurrent. Primary *umbel* sessile.

Syn.—*Assa foetida*. Hope in *Phil. Trans.* v. 75. t. 34.

Ferula persica. Willd. *Sp. Pl.* v. 1. 1413; *Ait. Kew.* v. 2. p. 136; *Bot. Mag.* v. 46. t. 2096; *Andrew's Reposit.* 558; *Pers. Syn.* 1. p. 312.

Persiches Sengenkrant. *Nom. Triv.* Willd.

ABOUT sixty years ago, seeds of this species of *Ferula* were sent to Pallas from the mountains of Ghilan in Persia, supposed to be those of the plant producing the assafoetida. From these, several plants were raised by the Professor at St. Petersburg, and two of them were sent by Dr. Guthrie to the late Dr. John Hope, Professor of Botany in the University of Edinburgh. Both these roots were planted in the open air in the Botanic Garden there, but one of them died; the other did well, and produced seed, and from this source, as Dr. Sims rightly conjectures, sprung the plant in the garden of the Apothecaries' Company at Chelsea, from which the figure in the Botanical Magazine, and that which embellishes our work, was made.

Though this is not the plant described by Kœmpfer as yielding the officinal assafoetida, it seems probable that there are

various species which afford a gum to which the name of assafoetida has been applied, but that the plant mentioned by this author is the one in which it exists in the greatest degree, or at least, which is usually employed for medical purposes. That the *Ferula persica* produces assafoetida seems confirmed by the strong smell of that drug which pervades the whole herb; and Dr. Sims informs us that he has collected small globules of true assafoetida that had exuded from the stem. The gum resin, known in the shops under the name of Sagapenum, which is brought to this country from Alexandria, is also supposed by Willdenow to be the produce of the *Ferula persica*. It is, indeed, mentioned by Dioscorides as the concrete juice of a species of *Ferula*, but of what particular species, without authentic materials, it is impossible for botanists to decide.

The *Ferula persica* is a hardy plant with a perennial root and annual stems. With us it rises with an erect, round, smooth, slightly striated stem, having only one pair of imperfect leaves about the middle, to the height of three feet. It is described by Dr. Hope as having branches that are naked and spreading; the three lower ones alternate, and supported by the concave membranaceous petiole of the imperfect leaf, the upper ones in whorls; all of them supporting a many-rayed, sessile, plano-convex, terminal umbel, besides from three to six branchlets placed on the outside, bearing compound umbels. The stem is surrounded at the base with six radical leaves, somewhat glaucous, which are petioled, spreading, 3-lobed, ovate, many times pinnate; with incised, acute, decurrent leaflets, of a deep green colour. The footstalks of the lower leaves are flat above, with a raised line running longitudinally through the middle of them. The umbels have from twenty to thirty general spreading rays, and from ten to twenty partial ones, with subsessile florets. The florets of the sessile umbels are fertile; of the peduncled umbel mostly abortive. The petals are yellow, equal, flat, ovate, at first spreading, but afterwards reflexed with the tip ascending. The filaments are awl-shaped, longer than the corolla, curved inwards, and bearing roundish anthers. The germen is inferior,

turbinate, with two reflexed styles, and an obtuse stigma. The fruit is oval, compressed, marked with three distinct ribs, separable into two parts. Every part of the plant abounds with a milky juice, having the odour and taste of assafœtida.

In Persia, when the stem and leaves begin to decay, the top of the root is cut off transversely, and the juice, after it exudes, is scraped off, and inspissated by exposure to the sun. The plant grows chiefly on the mountains in the provinces of Chorrassan and Laar, where it is named *hingisch*. It receives so great an alteration from the nature of the soil, on which it grows, that, according to Kœmpfer, at a small distance from the places above-mentioned, the juice is not worth collecting, being either exceedingly small in quantity, or entirely void of its fœtid smell. The plant is even reported to become so mild, not far from Disguun, that the goats greedily browse upon the leaves, and become surprisingly fat.*

QUALITIES AND CHEMICAL PROPERTIES.—This gum-resin is in irregular masses, composed of agglutinated pieces, which vary in colour from white to pink, and even a dark brown. Its odour is alliaceous, and extremely fœtid; it is, therefore, sometimes called *stercus diaboli*. It is with difficulty that it can be powdered, unless triturated with carbonate of ammonia. Its specific gravity is 1.327. It yields its virtue to alcohol and ether, and diffused in water by trituration, forms a milky opaque fluid.

To Pelletier it furnished by analysis;

Resin	.	.	.	.	65
Gum	.	.	.	.	19.44
Bassorine	.	.	.	.	11.66
Volatile oil	.	.	.	.	3.60
Malate of lime	.	.	.	(traces)	
Loss	.	.	.	.	3.30
					100

* For a full and highly interesting account of the mode of collecting and preparing Assafœtida, see *Amanitates Academica*, p. 535.

To Brandes,		
Resin	. . . . .	472
Gum	. . . . .	194
Volatile oil	. . . . .	46
Resinous substance	. . . . .	16
Tragacanth! (Cerasin?)	. . . . .	64
Extractive, with malate of lime	. . . . .	10 .
Sulphate of lime, with traces of potass	. . . . .	62
Oxide of iron	}	4
Water		
Phosphorus	. . . . . (traces)	
Acitate, malate, sulphate, and phosphate of potass and lime (traces)	
Impurities	46

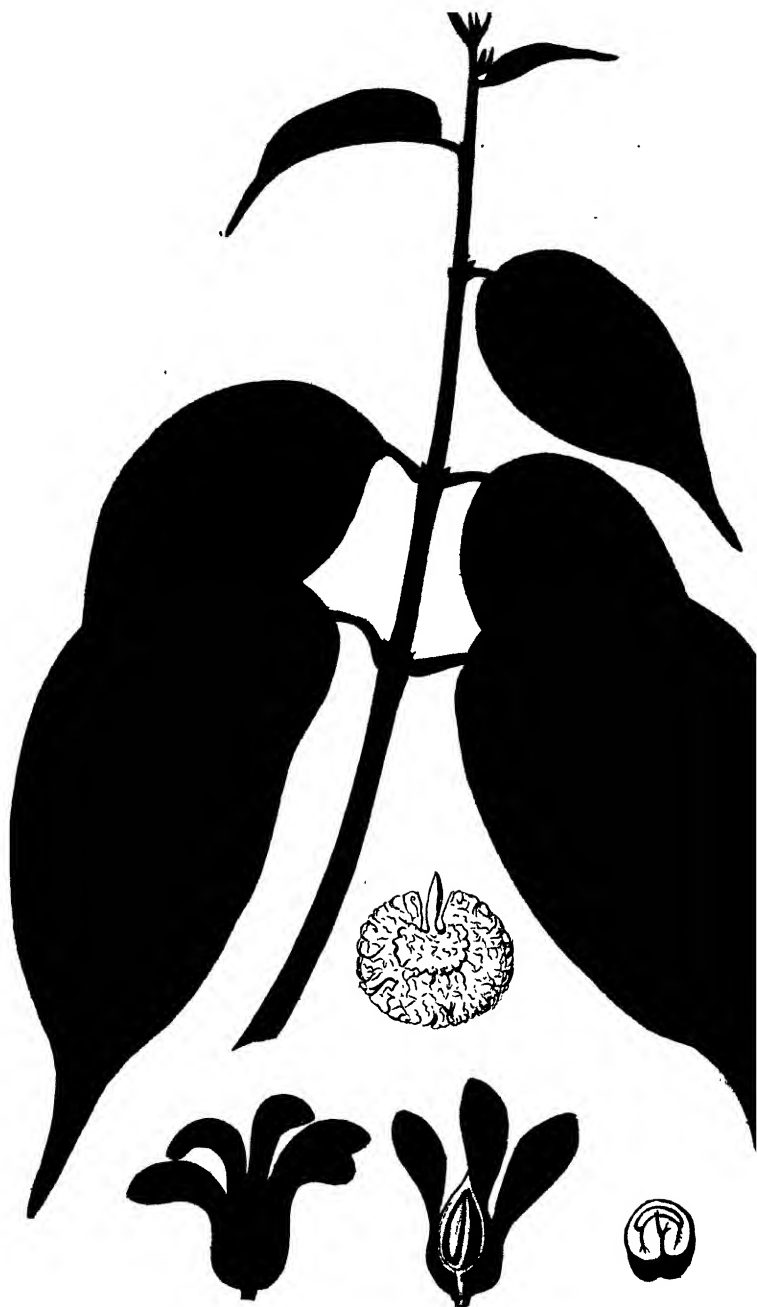
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MEDICAL PROPERTIES AND USES.—*Assafoetida* is employed as a powerful antispasmodic, being preferred for its quickness of operation, and efficiency, to any of the gum-resins. It is found useful in many nervous diseases, especially in hysteria, flatulent cholic, and tympanites. In dyspepsia, attended with flatulence, and in dyspnœa, it is very efficacious. Amenorrhœa is also benefited by it, and in the chronic coughs of old people, in asthma and pertussis, its expectorant properties render it serviceable. In India it is used by the natives as a specific for the Guinea-worm.

Diffused in water it is efficaciously injected for the convulsions of infants, and to destroy the parasites which infest the rectum. It is occasionally combined with antimonials and nitre to counteract its stimulant properties, and is given in substance in doses of from five grains to a scruple, in the form of pills. Formed into an emulsion, it is a nauseous compound, suited to few stomachs. Occasionally, it is employed as a discutient plaster.

Sagapenum is considered by European practitioners to be antispasmodic and emmenagogue. It is seldom employed, excepting as a substitute for *assafoetida*, when it is given in substance, in doses of from eight grains to a scruple. Externally, it is occasionally used as an ingredient in stimulating plasters.

OFF. PRÆP.—*Mistura Assafoetida*, L. D. *Tinctura Assafoetida*, L. E. D. *Spiritus Ammoniae Fœtidus*, L. D. *Tinctura Castorei comp.*, E. *Pilulæ Assafoetidæ, compositæ*, E. *Pilulæ Aloës et Assafoetidæ*, E. *Pilulæ Galbani compositæ*, L. *Enema Fœtida*, D.



Dryobalanops camphoralis.

DRYOBALANOPS CAMPHORA.

Camphor Tree of Sumatra.

Class XIII. POLYANDRIA.—Order I. MONOGYNIA.

Nat. Ord. GUTTIFERÆ, Juss. GUTTÆFERÆ, De Cand.
DIPTEROCARPIDÆ, Burnett.

GEN. CHAR. *Calyx* 1-leaved, permanent; enlarged into a gibbous cup, with five ligulate, long, scariose wings. *Corolla* 5-petalled. *Capsule* 3-valved, 1-celled. *Seed* solitary. *Embryo* inverse, without perisperm.

Syn.—Dryobalanops camphora. Colebr. in Asiat. Res. v. xii. p. 539; Malay Miscel.
1. p. 5.
Carpura, Sans.; Cáfúr, Arab.; Cdpúr, Hind.; Kapur Barus, Malay.

THERE are two species of trees from which the camphor of commerce is obtained. That with which Botanists have been longest acquainted is the *Laurus Camphora* of Linneus, a large forest tree, that grows wild in Japan. From the wood, root, and leaves of this tree, the camphor is extracted by distillation. It has been supposed, perhaps erroneously, that the greater part of this valuable drug imported from India, is exclusively the product of a tree belonging to a different genus, the *Dryobalanops camphora*. Kæmpfer, indeed, had long ago remarked, that the camphor which is found in a concrete state, occupying cavities and fissures in the trunk of a tree in the islands of Borneo and Sumatra, is not the *Laurus camphora*; but it is only within these thirty years that the discovery of the species which yields it, was made by Mr. H. T. Colebroke, who was enabled to determine the genus from the examination of some seeds

sent by Mr. Prince, a resident at Tapanooly, to Calcutta. Specimens in flower were also sent by the same gentleman to Sir Stamford Raffles in 1819, from which a full and correct description was drawn up by Mr. William Jack, and published by him in No. I. of the "Malayan Miscellanies." In Sumatra, the camphor trees are confined to the country of the Battas, which extends about a degree and a half immediately to the north of the equator; and they are found in Borneo in nearly the same parallel of latitude. This valuable tree is not known to exist in any other part of the world, and on this account, as well as the difficulty of obtaining its produce, the camphor it yields bears an exorbitant price. It appears to be little known in Europe; and is stated by Mr. Jack to be all carried to China, where it sells for twelve times as much as that of Japan.

The *Dryobalanops camphora* is found growing in great abundance in the forests on the north-western coast of Sumatra, especially in the vicinity of Tapanooly. It is a lofty tree, frequently attaining the height of ninety feet, with a trunk that measures six or seven feet in diameter. It is said to flower only once in three or four years. The trunk is arboreous, and covered with a brown bark. The leaves are opposite below, and alternate above, elliptical, obtusely acuminate, parallel, veined, entire, smooth, 3-7 inches long, one inch and a half broad, and supported on short petioles, with subulate, caducous stipules, in pairs. The flowers, according to Mr. Jack, are terminal and axillary, forming a kind of panicle at the extremity of the branches. The calyx is monophyllous, with five linear-lanceolate spreading teeth. The corolla is 5-petalled, longer than the calyx; the petals ovate-lanceolate, and in some degree adnate, or connected together at the base. The stamens are numerous, and have their filaments united into a ring, in which particular it differs from the genera most nearly related to it. The anthers are nearly sessile on the tube of the filaments, connive into a conical head round the style, and terminate in membranous points. The germen is superior, ovate, with a slender filiform style, longer than the stamens, and crowned by a capitate stigma. The capsule is ovate, woody, fibrous, longitudinally

furrowed, embraced at the base by the calycine hemispherical cup, and surrounded by its enlarged leaflets, which are converted into remote, foliaceous, spatulate, rigid, reflex wings; 1-celled, and 3-valved. The seed is solitary, thin, membranaceous, thickened along one side, and contained between the interior fold of the cotyledons.

The camphor is found, as already observed, in a solid state, occupying portions of about a foot, or a foot and a half, in the heart of the tree. The natives, in searching for the camphor, make a deep incision in the trunk, about fourteen or eighteen feet from the ground, with a billing or Malay axe; and when it is discovered, the tree is felled, and cut into junks of a fathom long, in order to allow of the extraction of the crystalline masses. The same trees yield both the concrete substance and a liquid or oily matter, which has nearly the same properties as the camphor, and is supposed to be the first stage of its formation. The product of a middling sized tree, is about eight China *catties*, or nearly eleven pounds, and of a large one, double that quantity. The Camphor thus found is called *Se Tanton*.

QUALITIES AND CHEMICAL PROPERTIES.—Camphor is imported into this country in chests and casks, chiefly from Japan, in small granular, or friable masses, and is afterwards purified by sublimation, in low flat-bottomed glass vessels, placed in sand, for that purpose. It is usually obtained in large cakes, concave on one side, and convex on the other, and generally perforated. It has a strong, peculiar, fragrant odour, and a bitter, acrid taste. It is white, transparent, unctuous to the touch, easily frangible, exhibiting a foliated or crystalline structure. It is not altered by exposure to the atmospheric air; but if it be not kept in well-stopt vessels, especially during warm weather, it evaporates completely. When sublimed in close vessels, it crystallizes in hexagonal plates or pyramids. It is somewhat ductile, but may be pulverised by moistening it with alcohol, and triturating it till dry. It is insoluble in water; but it communicates to that liquid a certain portion of its peculiar odour. It swims on water, its specific gravity being 3.9887. It dissolves readily in alcohol, and is precipitated again by water. It is also soluble in ether, acetic acid, the diluted mineral acids, the fixed and volatile oils, and unites with and converts the resins into a soft tenacious mass. When heat is applied to camphor it is volatilized; when heated under pressure, it melts at 288°, and boils at the temperature of 403°. It is decomposed by the strong sulphuric acid, forming artificial tannin; and by repeatedly distilling it with nitric acid, camphoric acid is obtained. When exposed to a strong heat it is decomposed, and resolved into a volatile oil, carbonic, and camphoric acids, and carburetted hydrogen, a portion of carbonaceous matter remaining. According to Dr. Ure's analysis, camphor is composed of one atom of oxygen, nine of hydrogen, and ten of carbon.

Camphor, or a substance analogous to it, exists in several other vegetables besides the *Laurus* and *Dryobalanops*; as mint, thyme, marjoram, and many other plants, and is held in solution by the essential oils obtained from them.

MEDICAL PROPERTIES AND USES.—There is still some difference of opinion respecting the action of camphor on the animal system; by some it has been regarded as a stimulant, while others maintain that it possesses considerable sedative powers. Its primary operation is that of an excitant, but its stimulant action is not very considerable. In moderate doses it increases the heat of the body, softens and increases the fulness of the pulse, and excites diaphoresis. In a large dose, it diminishes the force of the circulation, induces sleep, and sometimes produces delirium, vertigo, convulsions, or coma—effects which are best counteracted by wine and opium. As a stimulant, camphor has been used in typhus, cynanche maligna, malignant measles, confluent small-pox, and other febrile affections accompanied with debility; in gangrene combined with wine and bark; and in various spasmodic diseases; as hysteria, asthma, chorea, and epilepsy. As a *sédative*, it has been employed for allaying pain and irritation in pneumonia, acute rheumatism, gonorrhœa, small-pox, gout, mania; and in inflammatory fevers, where evacuations have been previously employed. In these cases, it is usually combined with antimonials and nitre. It is employed externally in frictions, dissolved in oils, alcohol, or acetic acid, as an anodyne in rheumatism and muscular pains, and as a discutient in bruises and inflammatory affections. In collyria, it is of advantage in ophthalmia, and is sometimes added to enemata to relieve the uneasy sensations occasioned by ascarides. Combined with opium, it is useful as a local application in tooth-ache.

DOSE.—From gr. v. to ʒj. diffused in almond emulsion.

OFF. PREP.—*Mistura Camphoræ*, L. D. *Emulsio Camphorata*, L. E. D. *Tinct. Camph. comp.* L. E. D. *Acid. Acetos. Camphoratum*, E. D. *Linim. Camphoræ*, L. E. D. *Lin. Camphoræ. comp.* L. *Lin. Hydrarg.* L. *Lin. Saponis*, L. E. *Lin. Sapo. c. Opio*, E. D.



QUASSIA SIMARUBA.

Simarouba Quassia.

Class X. DECANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. GRUINALES, *Lin.* MAGNOLIE, *Juss.* SIMARUBEÆ, *De Cand.*

GEN. CHAR. *Calyx* 5-leaved. *Petals* 5. *Nectary* composed of five scales. *Drupes* 5, distant, bivalve, placed on a fleshy receptacle.

SPEC. CHAR. *Flowers* monœcious. *Leaves* abruptly pinnate ; leaflets alternate, not quite sessile ; petiole naked. *Clusters* panniced.

Syn.—*Simarouba amara.* *Auhl. Guaian.* v. 2. 859. t. 331, 332.

Euonymus fructu nigro tetragono, vulgo *Simarouba.* *Barrere Franc. Equinox*, p. 50.

Le Simarouba vel Bois Amer. *March. Voy. en Guinée et à Cayenne*, v. 2. p. 124 ; *Bancroft's Nat. Hist. Guaiana*, p. 84.

Quassia Simarouba. *Lin. Suppl.* 234 ; *Willd. Sp. Pl.* v. 2. p. 568 ; *Ait. Kew*, v. 3. p. 42 ; *Woodw. v.* 2. t. 76 ; *Wright in Trans. Roy. Soc. Edin.* v. 2. p. 73 ; *Lunan. Hort. Jam.* v. 2. p. 521.

FOREIGN.—*Simarouba*, Fr. ; *Simarouba*, Ital. ; *Simarube Quassia*, Ger.

THE Wing-leaved or *Simarouba Quassia*, is a native of various parts of South America and the West Indies, growing in a sandy soil ; and flowering in November and December. It is known in Jamaica by the names of Mountain Damson, Bitter Damson, and Stave-wood. The bark has been known in Europe as an article of the *materia medica* for more than a century, but it is not many years since the species of plant was accurately determined. Dr. Wright, who has given a full account of this tree, informs us that, in 1773, specimens of the fructification were sent from Jamaica, in September, to Dr. Hope, at Edinburgh, with some dried bark of the roots, and that

the following year specimens were also transmitted to Dr. John Fothergill, of London, who sent them to Linneus, at Upsal. It was introduced at the royal garden at Kew, by Mr. Alexander Anderson, in 1787, but it has not yet blossomed.

This tree is common in all the woodlands in Jamaica. It grows to a considerable height, sending off alternate, spreading branches covered with a smooth, grey bark, marked with broad yellow spots. The wood is hard, white, and without any sensible bitter taste. The leaves are pinnate, and stand alternately upon the branches; each leaf consists of six, seven, or eight leaflets, placed alternately on short petioles, two inches long, ob-ovate, rather narrow, entire, smooth, of a deep green colour above, and whitish beneath. The flowers, which appear about the beginning of April, are of a yellowish white colour, monœcious, or, according to some writers, diœcious, and placed in branched spikes or long axillary panicles. In Jamaica, according to Dr. Wright, the male flowers are never found on the same tree with the female. The calyx is small, monophyllous, and divided into five obtuse, erect segments. The petals are five, lanceolate, equal, spreading, bent outwards, and triple the length of the calyx, into which, they are inserted. The nectary, in the male, is a small, hairy scale, affixed to the inner side of the base of each filament; in the female, the scales are placed in a regular circle. The filaments are ten, equal, about the length of the corolla, and furnished with oblong incumbent anthers. The receptacle is orbicular, fleshy, and marked with ten furrows. The germen is ovate, composed of five roundish germens adhering together, crowned with an erect, cylindrical style, about the length of the corolla, and divided at the top into five recurved stigmas. The fruit consists of five ovate, black, smooth, one-celled berries, all standing on a fleshy pentagonal receptacle, and opening spontaneously when ripe; each berry containing a solitary oblong pointed nut or seed. Fig. (*a*) exhibits a male flower; (*b*) a female flower; (*c*) nectary, with the stamen and anther; (*d*) the five berries attached to the common receptacle; (*e*) a berry detached; (*f*) the same cut across to show the nut; all magnified except the two last.

QUALITIES AND CHEMICAL PROPERTIES.—It is the root* of this tree which furnishes the bark termed *Simaruba quassia*. It is brought to us in long pieces of various sizes, which are rolled or curled inwards. They are very fibrous, tough, light, of a greyish colour externally, and of a yellow internally: they are also scaly, warted, and marked with prominent transverse furrows. *Simaruba* is inodorous, but powerfully bitter. It gives out all its active matter to alcohol, and water, by maceration, and forms with them a yellow solution. It seems to impart its virtues more perfectly to cold than to boiling water; the cold infusion being rather stronger in taste than the decoction. The infusion which is of a transparent yellow colour while hot, grows turbid and of a reddish-brown as it cools: it is not affected by the sulphate of iron, and muriate of tin occasions no precipitate.

According to an analysis by M. Morin, (*Journ. Pharm.* viii. 57,) it contains, 1st, a resinous matter; 2d, volatile oil, having the odour of benzoin; 3d, acetate of potass; 4th, an ammoniacal salt; 5th, malic acid, and traces of gallic acid; 6th, *quassine*;† 7th, malate and oxalate of lime; 8th, some mineral salts, oxide of iron, and silex; 9th, ulmine and woody matter.

MEDICAL PROPERTIES AND USES.—This bark was introduced into British practice many years ago, by Dr. Wright, as a valuable tonic and astringent in chronic diarrhœa, dysentery, and intermittent and remittent fevers. It had, however, been previously known in France, having been brought to that country from Guaiana about the year 1710. It is recorded, that in the years 1718 and 1720, an epidemic dysentery prevailed very generally in France, which resisted all the medicines usually employed in such cases; small doses of ipecacuanha, mild purgatives, and astringents, were found to aggravate rather than to relieve the disease. Under these circumstances, recourse was had to the cortex *simaruba*, which proved remarkably successful, whereby its medical character became established in Europe. Dr. Wright says, most authors who have written on the *Simaruba* agree, that in fluxes, it restores the lost tone of the intestines, allays their spasmodic motions, promotes urine and perspiration, removes the lowness of spirits attending dysenteries, and disposes the patient to sleep; the gripes and tenesmus are removed; and the alvine

* The Dublin College has fallen into an error in designating the wood, which is inert, as the part used in medicine. M. Fée observes, “ Nous avons vainement cherché des parasites sur l'épiderme du *simarouba*, qui est bien certainement l'écorce de la racine, et non celle du tronc.”—*Cours D'Histoire Naturelle Pharmaceutique*, p. 600. t. 1.

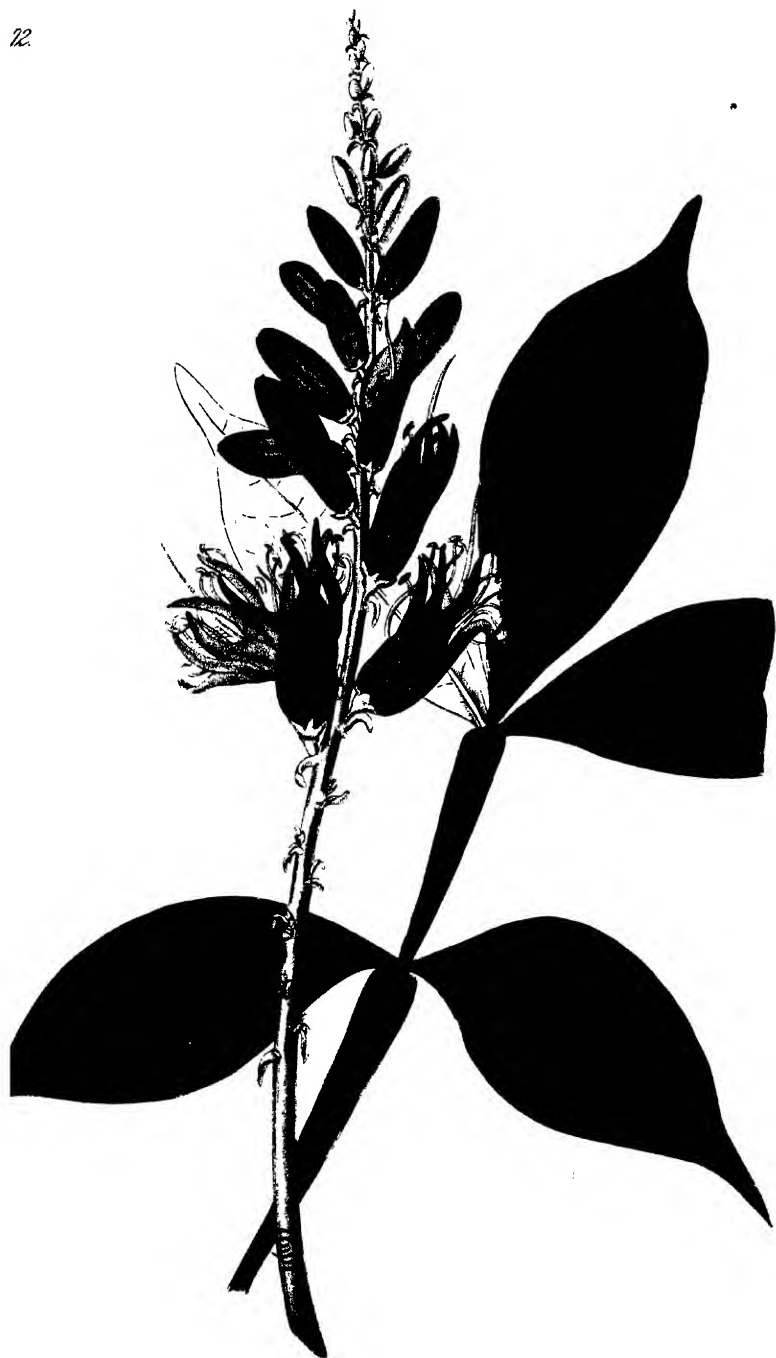
† For a detailed account of this principle, see *Quassia Excelsa*.

evacuations are changed to their natural colour and consistence. In a moderate dose, it occasions no disturbance or uneasiness, but in large doses it produces sickness at the stomach and vomiting.

“Modern physicians have found from experience, that this medicine is only successful in the third stage of dysentery, where there is no fever, where too the stomach is no way hurt, and where the gripes and tenesmus are only continued by a weakness of bowels. In such cases, Dr. Monro gave two or three ounces of the decoction every five or six hours, with four or five drops of laudanum, and found it a very useful remedy. The late Sir John Pringle, Drs. Huck, Saunders, and many others, prescribed the cortex simaruba in old and obstinate dysenteries and diarrhœas, especially those brought from warm climates. Fluxes of this sort, which were brought home from the siege of Martinico and the Havannah, were completely and speedily cured by this bark. The urine, which in these cases had been high coloured and scanty, was now voided in great abundance, and perspiration restored. Dr. James Lind, at Haslar Hospital, says, that the simaruba produced these effects sooner, and more certainly, when given in such quantity as to nauseate the stomach. Dr. Saunders remarks, that if the simaruba does not give relief in three days, he expected little benefit from its farther use; but others have found it efficacious in fluxes after a continued use for several weeks. My own experience, and that of many living friends, are convincing proofs to me of the efficacy of this medicine; and I hope the simaruba bark will soon be in more general use.”

Dr. Cullen says, that the high character given of the virtues of this bark, has not been ascertained in his own experience, and it is now seldom prescribed by British practitioners. It is given under the form of infusion, in the proportion of ʒij. or ʒiij. drachms to a pint of water; the dose may be ʒij. twice or thrice a day. In substance, the dose is from ʒj. to ʒss.

OFF. PREP.—Infusum Simarubæ, L.



QUASSIA AMARA.

Bitter Quassia.

SPEC. CHAR. *Flowers* hermaphrodite. *Leaves* pinnate ; leaflets opposite, sessile ; common stalk jointed, winged. *Flowers* racemose.

Syn.—*Quassia amara*. Lin. *Suppl.* 235 ; *Aman. Acad.* v. 6. 421. t. 4 ; *Willd. Sp. Pl.* v. 2. p. 567 ; *Aut. Kew.* 3. p. 42 ; *Plenck. Icon.* 333 ; *Woodv.* 2 t. 77 ; *Bot. Mag.* v. 13. t. 497.

Echte Quassie. Nom. Triv. Willd.

THIS beautiful shrub is a native of Surinam, and was introduced in 1790, by Mr. Alexander Anderson, to the royal garden at Kew, where it blossoms pretty freely, and continues flowering great part of the summer. It is the true officinal *Quassia*, but being very rare, and of small bulk, its place is usually supplied by the *Quassia excelsa*, which is imported in considerable quantities, not only for medical purposes, but as a substitute for hops. Willdenow, speaking of this plant, says, “*Quassia amara* est planta rarissima, lignum amaritie reliquis palmam præripit. Lignum quassiæ venale non ex hoc frutice venit ; colligitur a quassia excelsa, quæ minus amara.”*

The Bitter *Quassia*, as before observed, is a shrub rather than a tree, is branched, and covered with an ash-coloured bark. The leaves are alternate, consisting of two pairs of leaflets, with a terminal one ; they are elliptic-lanceolate, entire, veiny, very smooth, sessile, two or three inches in length, and of a deep green colour ; the common footstalk is linear, articulated at the insertion of each pair of leaflets, and winged, or edged on each side, with a leafy membrane, which gradually expands towards the base of each

* *Lund, Act. Soc. Hist. Nat.* 1. p. 68.

pair. The flowers are all hermaphrodite, of a bright scarlet colour, and terminate the branches in long spikes, drooping one way; the bracteas, or floral leaves, are lanceolate, reflexed, coloured, and placed alternately upon the common peduncle. The calyx is small, persistent, and five-toothed. The corolla consists of five lanceolate, equal petals, which is never fully expanded, but the petals, as Mr. Curtis remarks, being twisted spirally, curl round one another, and open in an irregular manner. At the base of the corolla is placed the nectary, which consists of five roundish, coloured scales; the filaments are ten, slender, somewhat longer than the corolla, and crowned with simple anthers, placed transversely; the receptacle is fleshy, and orbicular; the germen is ovate, five-parted, supporting a slender style, longer than the stamens, and terminated by an awl-shaped stigma.

The generic name of *Quassia*, was originally given by Linneus to this species, in honour of Quassi, a negro at Surinam, who discovered the virtues of the wood, in curing the malignant fevers of that country. In consequence of a valuable consideration this secret was disclosed to his patron, Governor Dalbergh, who sent specimens of the wood to Stockholm, in the year 1356; and since that time it became known in Europe, particularly by means of a Dissertation, printed in the *Amœnitates Academicæ*, first published in 1763.

QUALITIES.—The roots, bark, and wood of this tree, as its trivial name implies, are all intensely bitter; and it is observed, that the leaves, flowers, and other parts of the plant, possess similar qualities.

MEDICAL PROPERTIES AND USES.—These are the same, in a superior degree, as the species hereafter described.



QUASSIA EXCELSA.

Lofty, or Ash-leaved Quassia.

SPEC. CHAR. *Flowers* polygamous. *Stamens* 5.
Leaves pinnate; leaflets opposite, petioled; common stalk naked.

Syn.—*Quassia polygamia*. *Trans. Roy. Soc. Edin.* v. 3. p. 205. t. 6.

Quassia excelsa. *Swartz in Stockh. Trans.* for 1788, p. 302. t. 8; *Prodr. Ind. Occid.* v. 2. 742; *Willd. Sp. Pl.* v. 2. p. 569.

Unchte Quassie, *Nom. Triv. Willd.*

THIS species of *Quassia* grows spontaneously in the mountainous woods of Jamaica and the Caribbean Islands. It has been long known in the West Indies, not only as an excellent timber, but as a substitute for the *Quassia amara*, in the cure of intermittents, and bilious remittent fevers. By the English it is called *Bitter Wood*, and in the windward Islands the *Bitter Ash*. The bark has been much employed as an article of the materia medica, and the wood is imported into this country in considerable quantities for the purposes of the brewers of ale and porter. Sir Hans Sloane describes the *Quassia excelsa* in his catalogue, and refers to Plunkenet, Pl. 205, f. 3, which, however, is a different plant. Dr. Patrick Brown, and after him Mr. Long, in their Histories of Jamaica, notice this tree by the name of *Xylopicrum*, *Xylophia Glabra*, *Bitter Wood*, or *Bitter Ash*. Dr. Wright, in his account of the Medicinal Plants growing in Jamaica, mentions this species of *Quassia* under the title of *Picrania amara*; and Dr. Olaaf Swartz, who examined most of the plants of Jamaica, and the other West India Islands, styles it *Quassia excelsa*. No accurate description of the tree had, however, been given, till Mr. John Lindsay, a surgeon,

resident in Jamaica, published an account of it, with a figure, in the 3rd volume of the Transactions of the Royal Society of Edinburgh. Our drawing, which represents a cluster of the flowers rather under the natural size, with a leaf and fruit, was made from a dried specimen in the herbarium of the illustrious Linneus, now in the possession of the Linnean Society of London.

The *Quassia excelsa* is a beautiful, tall, and stately tree, frequently 100 feet in height, and 10 feet in circumference, with a straight, tapering trunk, sending off its branches towards the top, and covered with a smooth grey, or ash-coloured bark. The bark of the roots is of a yellowish colour, somewhat like that of the simaruba. The wood is of a pale yellow colour, tough, but not very hard, and takes a good polish. The leaves are pinnate, and composed of from four to eight pairs of nearly opposite, elliptical, pointed, firm, entire, smooth leaflets, from two to four, or even five inches in length, on short footstalks, with a terminal leaflet; the ribs reddish; and the young leaves are covered with a fine brownish down. The flowers are in clusters, or panicles, from the lower part of the last shoot before the leaves, bearing numerous small, pale, yellowish green flowers, some male, the rest hermaphrodite, in the same cluster: the male flowers are nearly similar to the hermaphrodite, except that they have the rudiments only of a style: the calyx is very small, with five equal, ovate, pointed segments; the corolla consists of five equal, lanceolate petals, shorter than the filaments. Swartz describes the nectary of five minute, villous scales, contrary to the remark of Willdenow, under his *Swingera*, (Sp. Pl. v. 2, 569,) where it is said to be wanting in this species of *Quassia*. The filaments are mostly five, seldom four or six, a little longer than the petals, downy, and supporting roundish anthers. The germen is ovate, with a slender style and trifid stigma. The fruit is a small black drupe, round, smooth, and of the size of a pea. These drupæ are usually three, sometimes two, and often only one, attached sideways to a round fleshy receptacle. It flowers in October and November, and the fruit is ripe in December and January. Fig. (a) exhi-

bits a male flower ; (*b*) a stamen ; (*c*) an hermaphrodite flower ; all somewhat magnified ; (*d*) a transverse section of the fruit.

QUALITIES AND CHEMICAL PROPERTIES.—This wood is sent to us in billets, of various sizes, which are reduced into shavings by the druggist. These shavings are of a pale yellow colour, perfectly inodorous, but intensely bitter. The bitterness is extracted equally by alcohol and water. When water is digested over *Quassia* for some time, and evaporated afterwards to dryness in a low heat, a brownish yellow substance remains, which retains a certain degree of transparency. It continues ductile for some time, but at last becomes brittle. This substance is called *Quassin* by its discoverer, Professor Thompson, of Glasgow, and is considered by him as *Quassia* in a state of purity. *Quassin* possesses the following properties :—

Its taste is intensely bitter. Its colour, brownish yellow. When heated, it softens, swells, and blackens ; then burns away without flaming much, and leaves a small quantity of ashes. It is very soluble in water and alcohol. It does not alter the colour of infusion of litmus. Lime-water, barytes-water, and strontian-water, occasion no precipitate ; neither is any precipitate thrown down by silicated potass, aluminated potass, or sulphate of magnesia. The alkalis produce no change in the diluted solution of the bitter principle. Oxalate of ammonia occasions no precipitate. Nitrate of silver renders the solution muddy, and a very soft flaky, yellow, precipitate falls slowly to the bottom. Neither corrosive sublimate nor nitrate of mercury occasion any precipitate. Nitrate of copper, and the ammoniacal solution of copper, produce no change ; but muriate of copper gives the white precipitate, which falls when this liquid salt is dropped into water. Sulphate and permuriate of iron occasion no change. Muriate of tin renders the solution muddy, but occasions no precipitate, unless the solution is concentrated ; in that case a copious precipitate falls. Acetate of lead occasions a very copious white precipitate ; but the nitrate of lead produces no change. Muriate of zinc occasions no change. Nitrate of bismuth produces no change, though when the salt is dropped into pure water a copious white precipitate appears. Tartar emetic produces no

change; but when the muriate of antimony is used, the white precipitate appears, which always falls when this salt is dropped into pure water. Muriate and arseniate of cobalt occasion no change. Arseniate of potass produces no effect. Tincture of nutgalls, infusion of nutgalls, and gallic acid produce no effect. These properties, remarks Dr. Thompson, are sufficient to convince us that this bitter principle differs considerably from all the other vegetable principles. The little effect of the different re-agents is remarkable; nitrate of silver and acetate of lead being the only two bodies which throw it down. These two salts are, therefore, incompatible in formulæ with it.

MEDICAL PROPERTIES AND USES.—Quassia is a simple and powerful bitter, possessing no aromatic principle. It is much employed as a cheap and useful tonic in dyspepsia, diarrhœa, remittent, intermittent, and continued fevers. It is usually given in the form of infusion, combined with neutral salts, or mineral acids. Orange-peel renders the infusion more grateful to the stomach. When recommended for intermittents it is prescribed in powder in doses from ten to thirty grains; but its bulk produces almost insupportable nausea, so that it is seldom administered in this shape.

OFF. PREP.—Infusum Quassiaë, L.

Infusum Quassiaë Excelsæ, E.

Tinctura Quassiaë Excelsæ, E. D.



PIPER NIGRUM.

Black Pepper.

Class II. DIANDRIA.—Order III. TRIGYNIA.

Nat. Ord. PIPERITÆ, *Lin.* URTICÆ, *Juss.* URTICÆ, *De Cand.*

GEN. CHAR. *Calyx* 0. *Corolla* 0. *Berry* 1-seeded.

Spadix simple.

SPEC. CHAR. *Leaves* broad-ovate, pointed, 7-nerved, coriaceous, smooth. *Joints* of the stem, tumid.

Syn.—*Piper rotundifolium nigrum.* *Bauh. Pin.* 411; *Raii Hist.* 1341; *Pluk. Almag.* 297. t. 437. f. 1; *Moris. Hist.* 3. p. 602. f. 15. t. 1. f. 1; *Blackw.* t. 348; *Burm. Zeyl.* 193.

Melago codi. *Rheede Malab.* v. 7. p. 23. t. 12.

Piper nigrum. *Ger. Em.* 1538; *Park. Theatr.* 1603; *Willd. Sp. Pl.* 1. p. 159; *Vahl. Enn.* v. 1. 329; *Woodv.* v. 3. t. 187.

FOREIGN.—*Poivre*, Fr.; *Pepe nero*, It.; *Pimiento*, Sp.; *Schwarzen pfeffer*, Ger.; *Gol-mirch*, Hind.; *Filfil Uswud*, Arab.; *Filfil seeah*, Pers.; *Laddu*, Malay; *Hootseau*, Chin.

PIPER-NIGRUM, the *tio-bo* of the Cochin-Chinese, the *melago-codi* of the Hortus Malabaricus, is a perennial plant, a native of the East Indies; and is much cultivated in Malabar, Java, Borneo, Sumatra, and the Philippine islands, whence the whole of Europe is supplied. It grows in the greatest abundance in the province of Malabar, and constitutes one of their principal articles of export. One thousand plants yield from 500 to 1,000 pounds of pepper.

It is a climbing plant, twining itself round any neighbouring support, and rising to the height of twelve or fifteen feet. The stems are round, smooth, jointed, woody, slender, branched, scandent, and if suffered to run along the ground, rooting at the joints. The leaves are broad-ovate, entire, pointed, coriaceous, smooth, shining, 7-nerved, of a deep green colour, and stand at the joints of the branches upon strong sheath-like footstalks. The flowers are small, sessile, whitish, without

calyx or corolla, and produced in long, slender, terminal spikes. The anthers are roundish, and placed opposite, at the base of the germen; the germen is ovate, and crowned with three rough stigmas. The fruit is a globular berry, green when young, but turning to a bright red when ripe and in perfection. Miller, from whose plate we have copied our dissections of the parts of the fructification, is the only author who describes a corolla, or calyx of one leaf, with three segments, in this plant. No person, says Sir James Smith, has been able to verify this representation; nor is it known whence Millar procured his drawing, unless perhaps from his son, a botanical artist, who visited India. His plate has always been considered as a valuable addition to the history of a plant so imperfectly known to botanists, and it is much to be regretted that any uncertainty should be attached thereto. Woodville's figure is a copy of Miller's. Our drawing was made from a dried specimen in the Linnean herbarium, gathered by Commerson, in Java. Fig. (a) represents the calyx, or corolla; (b) a flower cut open; (c) a section, to show the germen; (d) the fruit; (e) the same decorticated.

The Black Pepper, or pepper vine, as it is commonly called, is readily propagated by cuttings or suckers. If suffered to trail along the ground the plant would not bear; prop-trees being necessary for encouraging it to throw out its prolific shoots. These prop-trees, called *chinkareens*, commonly planted for this purpose in India, according to Dr. Ainslie, are the betel nut palm, (*Areca catechu*;) the moochiè wood tree, (*Erythrina indica*;) the mango tree, (*Mangifera indica*;) the jack tree (*Artocarpus integrifolia*;) and the *Hyperantha moringa*; but it has been remarked, that the vines which cling round the two last, thrive the best. The trees commonly preferred in the islands of the Eastern Archipelago, are the *Erythrina coralodendron*, and *mánghúdú* (*Morinda citrifolia*.)

The plant begins to bear about the third year, and is esteemed in its prime in the seventh, which state it maintains three or four years; it then gradually declines for about the same period. The vines generally yield two crops annually, the first in December, the second in July. As soon as any of the berries redden, the

bunch is reckoned fit for gathering, the remainder being generally full grown, although green. When gathered, they are spread on mats in the sun ; in this situation they become black and shrivelled, and as the pepper dries, it is rubbed occasionally between the hands to separate the grains from the stalks.

According to Mr. Milburn, the pepper countries extend from about the longitude of 96° to that of 115° E., beyond which none is to be found ; and they reach from 5° lat. to about 12° N., where it again ceases. Within these limits are Sumatra, Borneo, the Malay peninsula, and certain countries lying on the east coast of the Gulf of Siam. The whole produce of Sumatra is estimated at 168,000 peculs. At Palembang, which is the principal depôt for the pepper from the north coast of Sumatra, there is now produced upwards of 15,000 peculs. The islands at the mouth of the straits of Malacca and Singapore, produce 10,000 peculs, and Lingga about 2,000, most of which goes to the emporium of Singapore. The west coast of the Malay peninsula produces only 4,000 peculs, in the territory of Malacca ; the east coast yields a considerable quantity ; the ports of Patmi and Calantan about 16,000 peculs, and Tringana about 8,000. The east coast of the Gulf of Siam, from lat. $10\frac{1}{2}^{\circ}$ to $12\frac{1}{2}^{\circ}$ N., afford not less than 60,000 peculs, 40,000 of which go at once to the capital of Siam as tribute, and the whole finds its way to China in junks. The whole produce of Borneo is reckoned at about 20,000 peculs : adding this to the foregoing estimates, we find the aggregate production of pepper throughout the East to be 332,000 peculs, or 45,066,666 lbs. The average price of pepper lately has been about nine Spanish dollars the pecul, which gives the value of this spice, 3,142,000 dollars.

The pepper of Malabar is esteemed the best ; next, that of the east coast of the Gulf of Siam ; then follow those of Calantan ; Borneo ; the coast of Sumatra ; and last of all, the pepper of Rhio ; which, through the avidity of the cultivators and dealers, is plucked before it is ripe, and hence it is hollow and ill-coloured.

There are two sorts of pepper in commerce, black and white. The best black pepper is that which is well garbled and clean,

having the stalks, bad grains, and other impurities taken out, and is denominated heavy pepper ; it is the sort usually brought to Europe. This pepper when dry assumes a dark appearance, and is called *black* pepper : divested of its external coat, by steeping the grains in water, and afterwards drying them in the sun, it is termed *white* pepper.

QUALITIES AND CHEMICAL PROPERTIES.—Black pepper is aromatic, hot, and pungent. It yields its virtues to ether and alcohol, and partly to water. The infusion reddens vegetable blues. It is of a brown colour, which it owes to the outer coat. To analysis by M. Pelletier, black pepper yielded, 1st, piperin ; 2d, green concrete very acrid oil ; 3d, thick volatile oil ; 4th, coloured gummy matter ; 5th, extractive, analogous to that yielded by some leguminosæ ; 6th, malic and uric acids ; 7th, bassorine ; 8th, various earthy and alkaline salts ; 9th, woody fibre.*

Piperin, a new principle, has been lately discovered in black pepper by M. Œrstaedt, who believed it to be a vegetable alkali. This does not, however, appear to be the case ; but it bears considerable analogy to the resins, especially to that of cubebs, which M. Vauquelin compares with the balsam of copaiba. The following is M. Pelletier's method of obtaining it : “ After having digested the pepper repeatedly in alcohol, and evaporated the solutions, a fatty or resinous matter is obtained ; this must be subjected to the action of boiling water, which must be repeated until it passes off colourless. Then by dissolving this fatty matter (purified by washing in alcohol) by the aid of heat, and leaving the solution to itself for some days, a multitude of crystals is obtained, which may be purified by solution in alcohol and ether, and by repeated crystallizations. The alcoholic mother-waters, left to themselves, will afford fresh crystals, which are *piperin*, under the form of prisms, with four faces : two of which, parallel to each other, are evidently broader. These crystals are colourless and transparent, inodorous, and almost insipid. They are totally insoluble in cold water ; boiling water dissolves a small

* *Jour. Pharm.* vii. 273.

portion of them, which is precipitated on cooling. They are very soluble in alcohol, less so in ether. The peculiar properties of pepper appear to depend on an acrid volatile oil, which is associated with the piperin.

At page 286, vol. ii. of the Medical and Surgical Journal, another mode of obtaining *piperin*, by Mr. Carpenter, of the United States, is detailed.

MEDICAL PROPERTIES AND USES.—As a condiment, black pepper is too well known to need any explanation of its properties. Taken, however, in excess, it is injurious to persons of full habit, and is said to produce or aggravate hæmorrhoids. “As a medicine it is given to relieve nausea, or check vomiting, to remove singultus, and as a stimulant in retrocedent gout. Its dose is from 10 to 15 grains. Its infusion has been used as a gargle in relaxation of the uvula.”

According to Dr. Meli, piperin has the same febrifuge properties as the alkalies of the cinchonas. At the hospital of Ravenna he has cured a great number of cases of intermittent fever by it, and he goes so far as to affirm that its action is more certain, and more prompt than that of the sulphate of quinine. Dr. Elliotson, however, says, “Dr. Roots employed it at this hospital (St. Thomas’s) in five or six cases of ague, about three years ago, and ascertained that it cured the disease very well, but not better than quinine. There was no reason, therefore, to prefer it; and as it is far more expensive, none of us have employed it since.”* Majendie suggests the use of it in gonorrhœa in place of cubebs. The *dose* is much smaller than that of the sulphate of quinine. It may be carried as far as twenty-four grains in twenty-four hours.

OFF. PREP.—Confectio Piperis Nigri, L.

Unguentum Piperis Nigri, D.

Emplastrum Cantharidis vesicat. comp. E.

* See Clinical Lecture, reported in the “Lancet,” page 409, No. 354.

PIPER LONGUM.—*Long Pepper.*

SPEC. CHAR. Lower *leaves* cordate, stalked, 7-nerved ; upper cordate-oblong, sessile, 5-nerved.

Syn.—*Piper longum orientale.* Bauh. Pin. 412.

Cattu-tirpali. Rheed. Hort. Malab. v. 7. p. 27. t. 14.

Piper longum. Ger. Em. 1539 ; Raii Hist. 1343 ; Clus. Exot. 183 ; Blackw. t. 356 ; Rumph. Amb. v. 5. p. 335. t. 116. f. 2 ; Willd. Sp. Pl. 1. p. 161 ; Woodv. t. 188.

FOREIGN.—*Poivre longue.* Fr. ; *Pepe lungo,* It. ; *Pimienta larga,* Sp. ; *Langer pffer,* Ger. ; *Pipel,* Hind. ; *Täbee,* Malab. ; *Chabi-jawa.* Jav.

BLACK PEPPER is a native of the East Indies, particularly of the provinces of Malabar and Bengal. It is a perennial plant, with smooth, round, branched, slender, climbing stems, that do not rise to any considerable height. The leaves differ considerably in size and form ; the lower ones being cordate, pointed, 7-nerved, petioled ; the upper cordate, oblong, and 5-nerved ; they are alternate, smooth, entire, and of a deep green colour. The flowers are very minute, in dense, short, terminal spikes, which are nearly cylindrical. The parts of fructification, though less distinct, correspond with the description of the former species. The fruit consists of very small berries, lodged in a pulpy matter, which are at first green, and become red when ripe ; the fruit is hottest to the taste in the immature state, and is therefore gathered while green, and dried in the heat of the sun. It is imported in the entire spikes, which are about an inch and a half long, cylindrical, and of a blackish, or dark grey colour.

MEDICAL PROPERTIES AND USES.—The medical properties of long pepper are precisely the same as those of black pepper. Louriero, in his *Flora Cochinchinensis*, v. 1. p. 32, speaks highly of the medicinal virtues of this spice ; “ calefaciens, stimulans, deobstruens.” Dr. Ainslie says, the root of the long pepper is highly prized as a medicine by the Hindoos : it possesses the same qualities as the fruit, only in an inferior degree, and is prescribed by them in cases of palsy, tetanus, and apoplexy.



Piper cubeba L.

PIPER CUBEBA.

Cubeb, or Java Pepper.

SPEC. CHAR. *Leaves* elliptic-lanceolate, pointed, smooth, 5-ribbed, unequal at the base. *Spike* solitary, on a peduncle opposite to the leaves. *Berries* on partial stalks.

Syn.—Cubebæ, *Raii Hist.* 1813; *Park. Theatr.* 1583; *Clus. Exot.* 184.

Piper caudatum. *Ger. Em.* 1540; *Bauh. Hist.* 2. 185.

Piper Cubeba. *Willd. Sp. Pl.* 1. p. 159; *Vahl. Enn.* n. 61; *Gærtn. de Fruct.* 2. p. 67. t. 92.

THE plant which affords the officinal Cubebs is a native of Java, Nepal, Sierra Leone, and the Isle of France. The stems are round, smooth, zigzag, creeping or rooting, and striated, with somewhat tumid joints. The leaves are elliptic-lanceolate, pointed, entire, unequal at the base, two or three inches long, and one broad, solitary at each joint, with the principal ribs proceeding in alternate order from the main rib, and placed on short channelled footstalks. The flowers are minute and closely crowded in lateral and terminal spikes, two inches long, solitary, round, simple, opposite the leaves, and supported on short petioles. The fruit is a smooth, globular, 1-celled berry, on a short stalk, fleshy, and of a deep red colour at first, but becoming brown and coriaceous when dried; and containing a single roundish, ferruginous, wrinkled seed. With the exception of the fruit, we are not acquainted with any figure of this species of *Piper*. Our drawing was made from dried specimens in the Museum of the Hon. East India Company, collected in Java by Dr. Thomas Horsfield.—Fig. (a) exhibits the fruit detached; (b) a section of the same; (c) naked seed; (d) the embryo, from Gærtner.

have been adduced on behalf of cubebs, we seem to have no reason to doubt, that it has a specific effect on the diseased canal; but from the numerous trials we have given it, we are justified in maintaining the opinion which we published in 1822.* We then stated, that we had been anxious to learn the opinions of our medical brethren; amongst whom we had been able to meet with but one who placed any reliance on it, and he conjoined it with copaiba. All the others have been obliged to give it up, on the ground of inefficacy.

Dr. Stephenson has not found it of any service; but met with two cases in which very distressing hæmorrhoids were induced by it: and a surgeon in the city informed us, that in two cases it produced hæmaturia. Those persons to whom we have administered it, complained individually of the deep-seated headache it produced; and distressing diarrhœa is often its concomitant. One person complained of a pricking sensation in the soles of the feet; another of intense itching; and a third had a severe attack of urticaria febrilis; which it is well known is produced by a variety of substances, as shell-fish, mushrooms, almonds, &c. The nausea is likewise so great in some instances as to preclude the possibility of continuing its use.

By Dr. Fosbrooke,† cubebs have been much commended in cases of inflammation of the mucous membrane of the intestinal canal, conjoined with the oxide of bismuth: also in cases of chronic inflammation of the œsophagus, in union with carbonate of soda.

DOSE. From ʒj. to ʒij. every six hours, in a glass of milk.

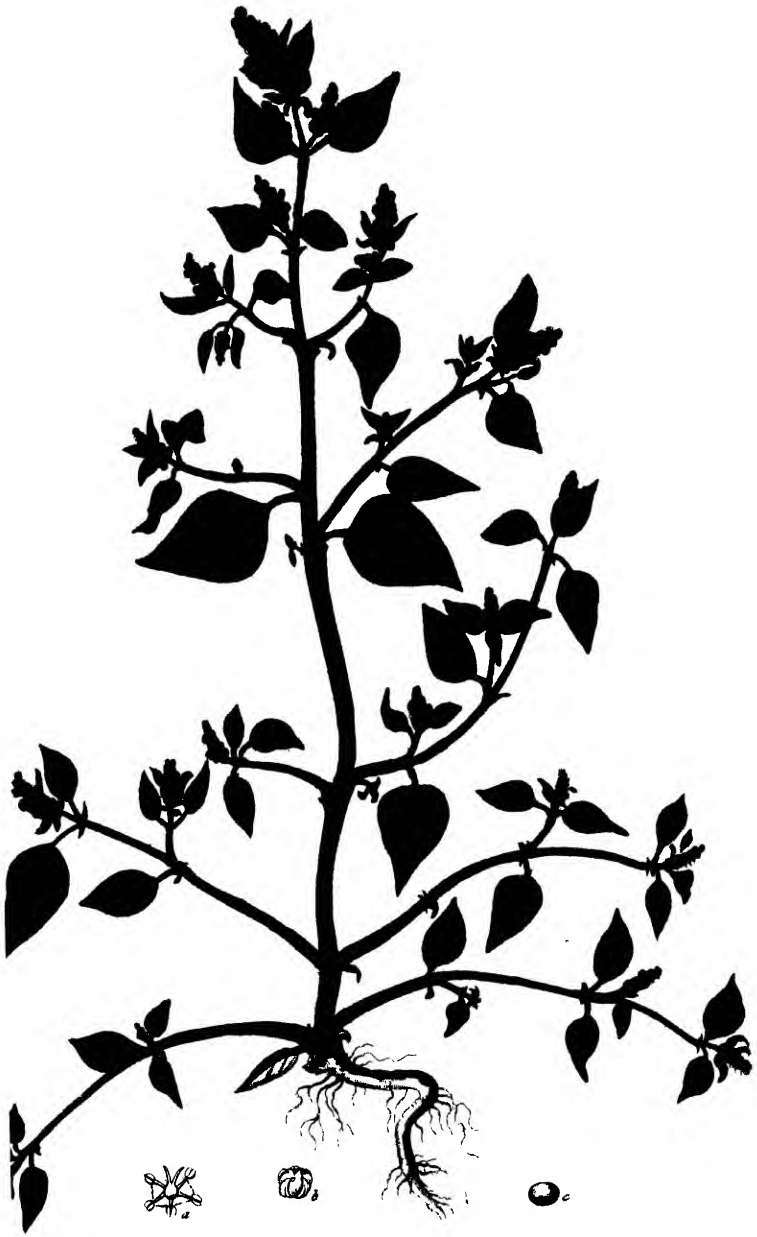
TINCTURA PIPERIS CUBEÆ, Th. D.

R Fructus Piperis Cubeæ ʒiv.

Spiritus Vini tenuioris lbij. Macerate for fourteen days, and strain.—Dose gʒss. x. to ʒj.

* See "*Observations on the Diverse Treatment of Gonorrhœa Virulenta*," &c. by J. M. Churchill. *Second Edition*.

† *Medical Repository*, p. 102.



Chenopodium olidum?

CHENOPODIUM OLIDUM.

Stinking Goose-foot.

Class V. PENTANDRIA.—Order II. DIGYNIA.

Nat. Ord. HOLERACEÆ, Lin. ATRIPLICES, Juss. CHENOPODEÆ, De Cand. CHENOPODIDÆ, Burnett.

GEN. CHAR. *Seed* lenticular, tunicated, superior.

SPEC. CHAR. *Leaves* ovate, somewhat rhomboid, entire. *Spikes* dense, axillary, leafless.

Syn.—*Blitum fœtidum, Vulvaria dictum. Raii Syn.* 156.

Atriplex olida. Ger. Em. 327. f.

Atriplex fœtida. Bauh. Hist. v. 974. f. 995; Moris. Hist. 2. t. 31. f. 6.

Garosmus. Dod. Pempt. 616. f.

Chenopodium. n. 1577; *Hall. Hist. v. 2.* 266.

Chenopodium vulvaria. Lin. Sp. Pl. 321; *Willd. v. 1. p.* 1305; *Woodv. t.* 145.

Chenopodium olidum. Fl. Brit. 277; *Eng. Bot. v. 15. t.* 1034; *Curt. Lond. t.* 20; *Hook. Scot.* 83.

FOREIGN.—*L'arroche fétide, Fr.; Vulvaria; connina, It.; Stinkender gänsefuss, Ger.*

THIS species, which is readily distinguished from all others of the genus, by its procumbent stem, and strong fœtid smell, is an indigenous annual, growing on waste ground, especially among sand or rubbish near the sea. It occurs sparingly in several places in the neighbourhood of London, at the foot of walls or paling, where it flowers from July to September.

The root is small and fibrous. The stems are several, branched, spreading, or prostrate, channelled, and grow from six to twelve inches high. The leaves are numerous, acute, entire, ovate, or slightly rhomboid, scarcely an inch long, and stand alternately upon short footstalks. The whole herb is of a dull green colour, and sprinkled with a white pellucid meal, which, when touched, exhales a strong nauseous odour, like stale salt-fish. The flowers are small, of a pale green or yellowish colour, and placed in ob-

long interrupted spikes. The calyx consists of one pentagonal leaf, cut into five acute, ovate, concave, permanent segments: there is no corolla. The filaments are awl-shaped, about the length of the segments of the calyx, and furnished with round, 2-lobed anthers. The germen is orbicular, and supports two short styles, terminated with obtuse stigmas. The seed is solitary, lenticular, dotted, and inclosed by the calyx, which supplies the place of a capsule. Fig. (a) represents a flower; (b) the calyx enveloping the seed; (c) a naked seed, slightly magnified.

QUALITIES AND CHEMICAL PROPERTIES.—According to MM. Chevalier and Lassaigne, this plant contains uncombined ammonia, on which its odour seems principally to depend. This odour is extremely nauseous, resembling that of putrid fish. Gerrard remarks, that “it is called stinking orrach by Cardus, *Garosmus*, because it smelleth like stinking fish; it is also called *tragium*, and *atriplex fetidagarum olens* by Pena and Lobel, for it smelleth more stinking than the ramnish male goat, whereupon some, by a figure, have called it *vulvaria*.” When the plant is bruised with water, and the liquor expressed and afterwards distilled, we procure a liquid which contains the subcarbonate of ammonia, and an oily matter, which gives the fluid a milky appearance. If the expressed juice of the chenopodium be evaporated to the consistence of an extract, it is found to be alkaline. On analysis, it has been found to yield subcarbonate of ammonia, albumen, ozmazone, an aromatic resin, a bitter matter, nitrate of potass in large quantities, acetate and phosphate of potass, tartrate of potash. It is said that one hundred parts of the dried plant produce eighteen of ashes, of which half are potash.

MEDICAL PROPERTIES AND USES.—This species of chenopodium once obtained a place in the London and Edinburgh Pharmacopœias, and was considered by Cullen to be a valuable anti-spasmodic. He gave it in hysteria, for which it is much commended by many old authors. Owing, however, to its losing its sensible qualities when dried, it gradually fell into disuse amongst medical men, and was discarded from our authorized materia medica.

Some years ago, Mr. Houlton, formerly the able Professor of Botany to the Medico-Botanical Society of London, being in the neighbourhood of Coggeshall, Essex, learnt from an old gardener, that the poor people were constantly employing it with great success as an emmenagogue. As the celebrated Dale lived in that neighbourhood, he thought it probable that this

knowledge of its virtues had been handed down from him ; and on reference to his *Pharmacologia*, p. 75, will be found the following statement ‘ *Uterina est, menses provocat, fœtum mortuum secundinamque expellit, in hystericis multùm prodest.*’ On making inquiries in town, it was ascertained that our old ladies were also well acquainted with its virtues ; and so regular is the demand for this herb at Covent Garden, that almost any quantity of it can be obtained from Mitcham, where it is regularly cultivated for the supply of the market. Under these circumstances, Mr. Houlton embraced several opportunities to put its merits to the test, and his success in *leuco-phlegmatic* habits has been eminently successful. In the *Medical and Surgical Journal*, of which he was one of the editors, he has satisfied himself by narrating one well-marked case of its successful operation ; and sent some of the extract, or rather inspissated juice prepared by spontaneous evaporation, to the *Medico-Botanical Society*, accompanied by a paper on its properties. Earl Stanhope, the noble president, whose admirable printed oration proves both the extent of his information and his wish to promote the increase of knowledge on these subjects, anxious for further proofs of the efficacy of the *C. olidum*, did Mr. Churchill the honour to send him a small quantity of the extract, accompanied by a request that he would try it, and communicate the result to the Society ; and he found on experiment, that in three cases out of four of suppressed menstruation, it immediately succeeded in restoring the secretion, unaccompanied by any other sensible effects.

It is well known, that the suppression of this periodical secretion is generally supposed to arise from deficiency of action in the uterine vessels, which has led to the general practice of giving tonics, or diffusible and permanent stimuli. It is doubtful, however, as Dr. Murray remarks, whether there is further, any particular determination to these vessels ; for although many substances, when received into the stomach, have their stimulant operation determined more particularly to one organ than to another, yet experience has not hitherto proved, that any of the substances styled *emmenagogues*, are capable of pro-

ducing their effect by any specific power. These remarks of Murray were certainly true when they were penned ; the only medicines that could be at all relied on, being hydragogue purgatives, which, from acting more particularly on the large intestines, communicate a stimulating effect to the vessels supplying the womb. Since his time, an indigenous vegetable substance, the *ergot*, or spurred rye, has been proved to exert its peculiar effects on the uterus ; and our readers, by referring to No. 29 of “ Medical Botany ” will find a full account of its chemical and medical properties, accompanied by a botanical description of the plant. If ergot be capable of producing such extraordinary effects, we would ask, why we should despair of finding a *direct emmenagogue*, or a medicine capable of producing a flow of the menses by its own peculiar or specific action on the uterus ? We are firmly convinced, that the *C. olidum* is possessed of such virtues ; and those of our readers who may be inclined to try the inspissated juice or *extract* in doses of from five to fifteen grains, given at bed-time, must bear in mind, that it does not succeed in plethoric habits, unless they have been reduced by venesection and saline purgatives ; nor is its success to be so often expected even then, as in the pale or cachectic patient.

Since the first edition of this work was published, a letter appeared in the *Lancet*, by a writer whose name we forget, in which our opinions were fully confirmed.



Rheum undulatum L.

Hed. del.

RHEUM UNDULATUM.

Waved-leaved, or Chinese Rhubarb.

SPEC. CHAR. *Flowers* villous, wavy; the sinus dilated at the base. *Petioles* flat above, with an acute edge.

Syn.—*Rheum sinense*, *Amm. Herb.* 206.

Acetosa montana. *Messerschm. in Amm. Ruth.* 226.

Rheum Rhabarbarum. *Lin. Syst. Veg.* 385; *Pallas It.* 2. 559.

Rheum undulatum. *Lin. Sp. Pl.* 531; *Amœn. Acad.* 3. p. 212. t. 4; *Willd.* 2. 489; *Hort. Kew.* 2. 450; *Plenck. Ic.* t. 321.

FOREIGN.—*Wellenblattriger Rhubarber*, *Ger.*; *Hai Houg*, *Chin.*

THIS plant is a native of China and Tartary. Like the *Rheum palmatum*, already fully described (Art. XXV.) it yields the roots which in our shops are known under the names of Chinese and Turkey rhubarb; although other species of *Rheum*, especially *compactum*, possess similar medicinal properties. The roots of this, as well as the other species, have been cultivated with success in this country, with a view of supplying the London market: but such is the prejudice in favour of the foreign article, that these attempts have generally failed.

The root is composed of numerous thick fibres, running further into the ground than the *palmatum*, and of a deep yellow colour. The flower stem is erect, three or four feet in height, and of a pale brownish colour. The leaves are numerous, large, oblong, somewhat tapering, villous above, much waved at their edges, and strongly veined beneath; they are supported on moderately thick footstalks, channelled on their under side, and plain on their upper. The flowers are white, in loose pannicles or bunches, which appear in May, and are succeeded by trian-

gular seeds of a rusty brown colour, like those of *R. palmatum*, which ripen earlier in the season. Fig. (a) represents a flower magnified; (b) the pistil; (c) seed.

QUALITIES AND USES.—The same as those of *Rheum palmatum*. Dr. Pulteney remarks, that if these two species are planted near each other, they produce a hybrid variety, more excellent in kind than the parent plants.

RHEUM COMPACTUM.—*Thick-leaved Rhubarb.*

SPEC. CHAR. *Leaves* somewhat lobed, very obtuse, shining, sharp-toothed, smooth.

Syn.—*Rheum foliis cordatis glabris marginibus sinuatis, &c.*; *Mill. Ic.* 2. t. 218.

Rheum compactum, Willd. Sp. Pl. 2. 489. *Ait. Kew.* 2. 431.

This species of *Rheum* is a native of Tartary, and is frequently substituted for the true rhubarb. The root is large, much branched, and internally yellow. The stems are five or six feet high, of a pale green colour, branched at the upper part, and having at each joint one sessile leaf of the same shape with those of the root, but smaller. The radical leaves are large, smooth, heart-shaped, broad at the base, coriaceous and compact, rather waved, petioled, and having a sharp acid flavour. The flowers, which appear in the latter end of May, are white, forming an erect pannicle or spike. The seeds resemble those of the preceding species.

About three years ago, another species of this genus, found on the Himalaya Mountains, was introduced to this country and was supposed to yield the true rhubarb. It was described by Mr. Don, under the name of *Rheum australe*, but it is not yet determined whether this or some other species yields the finest Turkey rhubarb. From some trials made with the roots dried at the Botanic Garden, Chelsea, it appears to possess but little or no cathartic power.



W.P.

WINTERA AROMATICA.

Officinal Winter's Bark Tree.

Class XIII. PÓLYANDRI.—Order III. TRIGYNIA.

Nat. Ord. MAGNOLIÆ, Juss. MAGNOLIACEÆ, De Cand.

GEN. CHAR. *Calyx* 2 or 3-cleft. *Petals* numerous.
Stamens club-shaped, with terminal 2-lobed anthers.
Style 0. *Berries* superior, aggregate. *Seeds* several,
 disposed in two rows.

SPEC. CHAR. *Leaves* elliptical, obtuse, coriaceous.
Flower-stalks aggregate, terminal. *Pistils* about four.

Syn.—*Laurifolia magellanica cortice acri. Raii Hist.* 1801; *Bauh. Pin.* 461.

Periclymenum rectum, foliis laurinis, cortice aromatico acri. Sloane in Phil.
Trans. v. 17. 923. t. 1. f. 1. 2.

Winteranus cortex. Clus. Exot. 75; *Dale Pharmacol.* 324.

Drimis Winteri. Forst. Act. Ups. v. 3. 181; *Lin. Suppl.* 269; *De Cand.*
Veg. 1. p. 443; *Prodr.* 1. p. 78.

Wintera Aromatica. Willd. Sp. Pl. 2. 1239; *Murray in Lin. Syst. Veg. ed.*
14. 507. *Forst. Pl. Magell.* 24. t. 7; *Comm. Gætt.* v. 9. 34. t. 7; *Soland.*
in Med. Obs. & Enq. v. 5. 41. t. 1.

THIS tree is a native of the straits of Magellan, growing in valleys exposed to the sun, where it was first observed by Capt. Winter, and has since been found by several other navigators; but no one has brought living plants, or seeds, to Europe. Dr. Solander has given an accurate botanical description of it, illustrated by a figure, in "Medical Observations and Enquiries," vol. vi. p. 46.

The Winter's-bark tree, *Wintera aromatica*, is one of the largest trees upon Terra del Fuego, and often rises to the height of fifty feet. It is a handsome evergreen, with many twisted knotty branches which do not spread horizontally, but bend upwards, and form an elegant head of an oval shape. The trunk is covered with a thick gray rugged bark, which on the branches is green and smooth. The leaves are alternate, crowded about the ends of the branches, elliptical, obtuse, entire, about two inches in length, and one and a half wide, of a bright green colour,

coriaceous, somewhat revolute, with a stout midrib, and scarcely visible veins, very smooth on both sides, usually somewhat glaucous beneath, and stand on broad, short, smooth footstalks. The pedicles of the flowers are axillary, near the extremity of the branches, two or three together, simple or three-cleft, smooth, not half the length of the leaves, and accompanied at their base by several ovate, pale, deciduous bracteas. The flowers are small, of a milk-white colour, with the odour of jasmine. The calyx is green or reddish, coriaceous, and unequally three-lobed. The corolla consists of seven petals, which are unequal, ovate, obtuse, concave, and erect : the filaments are from fifteen to thirty, shorter than the petals, supporting large ovate anthers. The germens are from three to six, turbinate, and terminating in as many sessile, flat stigmas. The berries are ovate, of a greenish colour, spotted with black, each containing four triangular seeds. Fig. (a) exhibits the calyx ; (b) a petal, magnified ; (c) anther, back and front, both magnified : (d) the germens ; (e) a germen detached ; (f) section of the same, showing the rudiments of the seed.

The generic name, *WINTERA*, was given in memory of the companion of Sir Francis Drake, Captain William Winter, who brought the bark to Europe, from the straits of Magellan, about the year 1579. Linneus, meaning to commemorate the discovery, established a genus by the name of *Winterana*, G. Pl. 238, the bark of which he considered to be what Winter introduced. But the Linnean plant is *Canella alba*, to the fructification of which alone the description applies. Browne had already founded this genus by the name of *Canella* ; and Swartz, as well as Murray, have confirmed it. Meanwhile Foster, having found and investigated the fructification of the Winter's bark tree, described it by the name of *DRYMIS*, alluding to its hot and pungent flavour. This is retained by the younger Linneus, in his *Supplementum*, with a remark properly distinguishing it from the *Canella alba* ; though his father, like Professor Bergius, Mat. Med. vol. i. 381, had confounded them. Five species, belonging to this genus, have been described by De Candolle.

QUALITIES.—Winter's bark is of a dark cinnamon colour, has an aromatic smell, and a warm, pungent, spicy taste, depending principally on an essential oil, which can be separated in distillation with water. The watery infusion strikes a deep black with sulphate of iron.

MEDICAL PROPERTIES AND USES.—This bark is carminative and tonic ; and though much celebrated as an antiscorbutic by its first discoverers, is with us unknown in practice. In substance, the dose may be from gr. x. to ʒj.



Dolichos pruriens

G. Re. d. del.

Widdow.

DOLICHOS PRURIENS.

*Cow-itch Dolichos.**Class XVII. DIADELPHIA.—Order IV. DECANDRIA.**Nat. Ord. PAPILIONACEÆ, Lin. LEGUMINOSÆ, Juss., De Cand.*GEN. CHAR. *Vexillum* with two calli at the base.SPEC. CHAR. *Legume* racemose ; valves keeled, hairy.*Peduncles* in threes.Syn.—*Phaseolus Zurattensis*, *siliqua hirsuta*, *Couhage dicta*. *Rail Hist.* 887.*Phaseolus siliquis hirsutis*. *Park. Theatr.* 1056.Stinging Beane. *Ger. Em.* 1205.*Phaseolus Americanus*. *Pluk. Alm.* 292 ; *Phyt. t.* 214. *f.* 1.*Cacara pruritus*. *Rumph. Amb.* 393 ; *t.* 142.*Nui corana*. *Rheede Malab.* 8. *p.* 61. *t.* 35.*Phaseolus utriusque Indiæ*. *Herm. Prodr.* 364 ; *Sloane Hist.* 1. 37.*Stizolobium*. *Browne Jam.* 290. *t.* 31. *f.* 4.*Carpopogon pruriens*. *Roxb. MSS.* 235.*Dolichos pruriens*. *Willd. Sp. Pl. v.* 3. *p.* 1041 ; *Jacq. Amer. p.* 201. *t.* 122 ;*Mill. Ic. n.* 3 ; *Ait. Kew.* 4. *p.* 293 ; *Woodv. S. t.* 172 ; *Stokes Bot. Mat.**Med.* 4. *p.* 22.FOREIGN.—*Pois à gratter*, Fr. ; *Cacara* ; *Naicorana*, Port. ; *Juckende* ; *Faseln* ; *Kratzbohnen*, Ger. ; *Nai-corana*, Malab. ; *Kiwách*, Hind. ; *Cad-juct*, Beng.

THE Cow-itch *Dolichos*, the hairy pods of which have been long celebrated as an anthelmintic, grows spontaneously in the mountainous woods of Martinique, on the banks of rivers ; also in the East Indies, where it flowers in the cool months, from September to March. It appears to have been cultivated in England in the time of Ray, and now is not an uncommon inhabitant of our stoves ; but the plant seldom blossoms in this country. For the figure which accompanies the following description, we are indebted to the liberality of Dr. Thomas Horsfield, F.R.S., the highly respectable author of the “ Zoological Researches in Java,” in whose herbarium, in the museum of the Honourable East India Company, we found several specimens of the plant in a high state of preservation.

The root is perennial and fibrous. The stem is herbaceous, climbing, cylindrical, tomentose, divided into many branches, which twist round the neighbouring trees, and rise to a considerable height. The leaves are ternate, upon footstalks, from six to fourteen inches long, placed alternately at the distance of a foot from each other; the central leaflet is rhomboidal, the two lateral ones oblique, and all of them entire, pointed, from three to five inches long, waved on the edges, smooth on the upper surface, and hairy beneath. The flowers are papilionaceous, large, inodorous, of a purplish, or rich violet colour, and placed mostly in ternaries, upon short pedicels, in pendulous, solitary spikes, about a foot in length, which hang from the axillæ of the leaves, and make a magnificent appearance. The proper flower-stalks are about half an inch long, furrowed, hairy, and furnished with small stipulæ. The calyx is bell-shaped, gibbous at the base, downy, divided into two lips, of which the upper is smaller, semiovate; the under separates into three lanceolate segments. The corolla consists of a vexillum, or standard, which is roundish, entire, concave, obtuse, and double the length of the calyx; a carina, which is scythe-shaped, of the length of the alæ, compressed, and at the apex furnished on each side with a short spur. The filaments are ten, nine of which are united at the base, the four alternate ones being longer, and supporting incumbent anthers; in the shorter filaments the latter are placed vertically. The germen is oblong, villous, and supports a slender style, about the length of the filaments, terminated by a small orbicular stigma. The fruit is a coriaceous pod, about four inches long, compressed, curved like the letter S, thickly set with bristly, short, reddish, prurient hairs; and containing four, five, or six oval seeds, of a brown colour. Fig. (a) represents the carina; (b) anthers; (c) pistil; (d) seed.

MEDICAL PROPERTIES AND USES.—The pods of the *Dolichos pruriens* are brought from the West Indies. They are densely covered externally with short hairs, which penetrate the skin when touched, and cause a very troublesome itching. Advantage has been taken of this irritating quality to expel worms from the human intestines; for this purpose they have been long

advantageously employed in the West Indies, especially for the removal of the round worm, *lumbricus teres*, L. One of the earliest accounts, published in this country, of the vermifuge powers of the hair of the pods of the cow-itch, is that by Mr. Kerr, in the Edinburgh Medical Commentaries. Sir Hans Sloane notices the diuretic qualities of the roots and pods of this plant, but takes no notice of its vermifuge effects. Dr. Patrick Brown, however, informs us, that in the Windward Islands, a syrup is made of the pods, which is a very effectual remedy against worms. But the most complete account, showing the efficacy of this medicine as an anthelmintic, is that of Dr. Bancroft, in 1759, who resided many years in Guiana, a Dutch settlement in South America, where the inhabitants, particularly the slaves, are much afflicted with intestinal worms. After stating the frequency of worms in that country, and endeavouring to account for it, he adds, that "from whatever cause these worms originate, their number is so great, and their power so prolific, that the usual remedies are insufficient for their destruction; for which reason the planters in general have recourse to cow-itch for that purpose. The part used is the setaceous hairy substance, growing on the outside of the pod, which is scraped off, and mixed with the common syrup, or molasses, to the consistence of a thin electuary, of which a tea-spoonful to a child two or three years old, and double the quantity to an adult, is given in the morning fasting, and repeated the two succeeding mornings; after which, a dose of rhubarb is usually prescribed. This is the empirical practice of the planters, who usually, once in three or four months, exhibit the cow-itch in this manner to their slaves in general, but especially to all the children, without distinction; and in this manner I have seen it given to hundreds, from one year and upwards, with the most happy success; the patients, after the second dose, usually discharging an incredible number of worms, even to the amount of more than twenty at a time, so that the stools consisted of little else than these animals. But though these were indisputable proofs of its efficacy, I was far from being convinced of its safety. I observed, that the substance given consisted of an assemblage of spiculæ, exqui-

sitely fine, and so acutely pointed, that when applied to the skin they excited an intolerable itching, and even inflammation ; from whence I apprehended dangerous consequences from their contact with the coats of the stomach and intestines. Indeed, when mixed into an electuary, in the manner in which they are given, their elasticity is so impaired, that they do not produce the same sensible irritation ; but yet I could conceive no other quality on which their efficacy depended, especially after I had prepared both a tincture and decoction from cow-itch ; and yet can, with the greatest truth, declare, that, though prejudiced to its disadvantage, I was never able, either by my own observations, or diligent inquiry, to discover a single instance of any ill consequence resulting from its use, which has been so extensive, that several thousands must have taken it ; and as no ill effects have been observed, I think, not only its efficacy, but safety, are sufficiently evinced to entitle it to general use, especially when we reflect on the uncertainty, and even danger, which attends on vermifuges.”* Whether this remedy is equally deleterious to the *ascarides*, he says, he cannot speak, as he has not seen it tried against them. For this last purpose, Dr. Mason Good suggests its employment in the form of mucilaginous injections. It was a favourite remedy with Dr. Macbride, who, in his introduction to the “ Theory and Practice of Physic,” has strongly recommended it. It is a fact well-known to entomologists, that the hairs of the caterpillars of several moths occasion a most violent itching, particularly those of the procession moth (*Lasio-campa processionea*), of which Reaumer has given so interesting an account. Hence it has been supposed, that the hair of the caterpillars, here alluded to, might probably be found equally efficacious as an anthelmintic.† A decoction of the pods of this plant is said to be powerfully diuretic, and a vinous infusion is occasionally administered in dropsy. A strong tea, made with the roots, and sweetened with honey, has been recommended by the native doctors of India as a remedy for cholera.‡

* *Essay on the Natural History of Guiana*, p. 390.

† Kirby and Spence's *Introduction to Entomology*, v. 1, 5th ed. p. 130.

‡ Burnet's *Outlines of Botany*.



Aristolochia Serotina

ARISTOLOCHIA SERPENTARIA.

Virginia Birthwoot, or Snake-root.

Class XX. GYNANDRIA.—Order IV. HEXANDRIA.

Nat. Ord. SARMENTACEÆ, Lin. ARISTOLOCHIÆ, Juss., De Cand.

GEN. CHAR. *Calyx* 0. *Corolla* monopetalous, ligulate, ventricose at the base. *Capsule* 6-celled, inferior.

SPEC. CHAR. *Leaves* cordate-oblong, acuminate. *Stems* weak, flexuous, round, *Flowers* solitary; peduncles solitary; lip of the corolla lanceolate.

Syn.—*Pistolochia*, sive *Serpentaria virginiana*. *Ger. Em.* 847. 5; *Clus. Hist.* 72;

Catesb. Carol. t. 29; *Raii Hist.* 3. p. 394; *Dod. Pempt.* 525.

Aristolochia, polyrrhizos virginiana. *Moris. Hist.* 3. p. 310. t. 17.

Aristolochia Serpentina. *Lin. Sp. Pl.* 1363; *Willd. v.* 4. p. 159; *Jacq. Schænbr.* 3. t. 385; *Hort. Kew. v.* 5. p. 226; *Michaux Bor. Amer.* 2. p. 162.

FOREIGN.—*Serpentaire*, Fr.; *Serpentaria de Virginia*, Port.; *Vergunische Schlangen—oder Vipernwurzel*; *Aizeneylnäftige Osterlusey*, Ger.; *Slang-rod*, Dan.; *Ömrot*, Swed.

SNAKE-ROOT is a native of North America, growing in the woods, according to Pursh, from Pennsylvania to Florida; flowering in May and June, and ripening its seeds in September.

It is a perennial plant of humble growth, being most commonly under a foot in height. The root is composed of bundles of small fibres, of a yellowish colour, which changes to brown on drying, attached to a contorted horizontal head, and sends up several small slender stems. These are simple, or slightly branched, somewhat downy, round, flexuous, jointed, about ten inches in height, and often of a reddish tinge. The leaves are alternate, on short petioles, oblong, entire, acuminate, heart-shaped at the base, and three-nerved. The flowers are monopetalous, of a stiff leathery texture, and of a dull brownish purple

has been highly extolled by Cullen, Monro, and other eminent physicians, while, in America, it has received its due meed of praise from Rush, Barton, Bidgelow, &c. By us it is simply employed as a powerful tonic and diaphoretic, and it occasionally acts as an antispasmodic and anodyne.

In some exanthematous diseases, and in the advanced stage of fevers, this root is highly prized, administered alone or in combination with other tonics. It appears to support the powers of life, and to allay those irregular actions of the nervous system, the consequences of fever, as subsultus tendinum, picking of the bed-clothes, low delirium, and watchfulness. It is supposed that the camphor which it contains contributes to produce these salutary effects. It is generally combined with cinchona, or with wine and opium; and enters into Huxham's, or the compound tincture of bark. We are not aware that it is capable of curing intermittents by itself; but Sydenham states, that in all cases where it is expedient to combine wine with bark, the effects will be much increased by adding serpentaria. It also enables the stomach better to retain the bark. In remittent fever, especially when the remission is obscure, or not easily discerned, snake-root is by some preferred to cinchona, as it is seldom offensive to the stomach, and is free from mischief. In America, where bilious vomiting is a frequent disease, it is found an efficacious remedy, checking the nausea and tranquillizing the stomach. It is given for this purpose in decoction, in doses of a table-spoonful at a time, frequently repeated. Externally, it is used as a gargle in cynanche maligna.

The most common form of exhibiting it, is in infusion, made by pouring a pint of boiling water on half an ounce of the root, and allowing it to steep for two hours in a covered vessel. The dose is an ounce and a half every four hours. Boiling dissipates its volatile qualities. In powder, its usual dose is from gr. x. to ʒss.

OFF. PREP.—Tinctura Serpentariæ, L. E. D.

Tinctura Cinchonæ composita, L. E. D.

Electuarium Opiatum, E.



Garcinia Cambogia!

GARCINIA CAMBOGIA.

Gamboge Mangostan.

Class XI. DODECANDRIA.—Order I. MONOGYNIA.

Nat. Ord. GUTTIFERÆ, Juss.

GEN. CHAR. *Calyx* inferior, of 4 leaves. *Petals* 4.
Berry coriaceous, of several cells, crowned with
 the stigma. *Seeds* solitary.

SPEC. CHAR. *Leaves* elliptical, acute at each end,
 their veins rather distant. *Stigma* 8 or 10-lobed.
Fruit furrowed. *Branches* round.

Syn.—*Cambogia gutta*. *Lin. Sp. Pl.* 728.

Carcapuli. *Clus. Exot.* 286.

Coddam-pulli. *Rheede Hort. Malab.* v. 1. 41. t. 24.

Mangostana Cambogia. *Gartn.* v. 2. 106.

Garcinia Cambogia. *Willd. Sp. Pl.* v. 2. p. 848.

ALTHOUGH the gamboge of the materia medica is principally obtained from the *Stalagmitis Cambogioides*, hereafter described, yet there is some reason to believe that the *Garcinia Cambogia* of Linnæus, and several other plants of the natural order of the guttiferæ, yield a substance very nearly, if not entirely, similar to that of the shops. This tree is a native of Malabar, growing in the forests of Travancore, where it is known to the natives by the name *Ghorkapuli*; flowering in March, and ripening its fruit in June and July.

It is a tall tree, with a trunk about four inches in diameter, and widely spreading, round, smooth branches. The leaves are opposite, three or four inches long, elliptical, entire, tapering at each extremity, smooth, paler beneath; their lateral veins few and distant, forming very acute angles with the midrib, and placed on short channelled footstalks. The flower stalks, which are nearly an inch long, grow in pairs just below the insertion of each leaf, and are by no means terminal. The calyx is 4-leaved, consisting of two opposite pairs of leaflets, the exterior

pair rather smaller; all nearly round, firm, fleshy, smooth on both sides, and permanent. The petals are four, roundish, twice the length of the corolla, and of a yellow colour. The filaments are from fifteen to twenty, shorter than the germen, slightly united at the base, and bearing roundish anthers. The germen is superior, round, 8-10 lobed, 8-10 celled, with one ovule in each cell. There is no style. The stigma is pel-tate, with as many divisions as there are cells in the germen. The fruit is pendulous, the size of a small orange, but furrowed like a melon, and crowned with the tumid crenate remains of the stigma; it is of a yellow colour when ripe, and containing a sweetish pulp, with some degree of acidity. The seeds are said to be from eight to ten, each enveloped in its own proper, succulent, yellowish aril.—Fig. (a) exhibits a flower with the germen removed; (b) fruit; (c) section of the same; (d) seed.

From the trunk and branches, when wounded, exudes a viscid, but tasteless juice, which hardens into a brownish yellow gum-resin, which, according to Kœnig and Roxburgh, is much inferior in colour to the true gamboge.

MEDICAL PROPERTIES AND USES.—See the article, **STALAGMITIS**.

STALAGMITIS CAMBOGIOIDES.—*Gamboge Tree*.

Class XXIII. POLYGAMIA.—**Order I. MONŒCIA.**

Nat. Ord. GUTTIFERÆ, **Juss.** GUTTIFERÆ, **De Cand.** GARCINIDÆ, **Burnett.**

GEN. CHAR. *Calyx* 4-leaved. *Corolla* 4-petalled. *Stamens*, about thirty, inserted into a fleshy 4-angled receptacle. *Style*, thick. *Stigma*, 4-lobed. *Berry*, 1-celled, crowned by the style, 3-seeded.

Syn.—*Arbor indica, quæ gummi guttæ fundit.* *Herm. litt. in Hort. Malab. cit.*

Arbor polygama fructu cerasiformi eduli. *Kœnig, in Retz. Obs. Bot. 4. p. 6.*

Guttifera vera. *Kœnig, in MSS. Banks.*

Stalagmatis Cambogioides. *Murray Comm. Gött. v. 9. p. 173; Willd. Sp. Pl. 4. p. 980.*

FOREIGN.—*Indischer guttabaum, Ger.; Ghokkatu, Cing.*

THE Gamboge-tree is a native of the kingdom of Siam, and of the island of Ceylon. According to Murray, it is of middling

stature, with an erect trunk, covered with a pale ash-coloured bark, and moderately branching. The leaves are on short petioles, ovate, opposite, pointed, entire, smooth, rigid, and of a dark green colour. The flowers are axillary, or lateral, whorled; the male ones either intermixed with the others, or in clusters by themselves. The calyx consists of four or six ovate leaflets, the two exterior of which are smaller than the interior, and both are striated with yellow lines; the petals are four, obovate, rather coriaceous, fringed, spreading, twice the length of the calyx, of a pale yellow colour, and rosaceous at the base. The stamens are about thirty, affixed to a quadrangular fleshy receptacle, and bearing subquadrangular club-shaped anthers; sometimes there is the rudiment of a style, and an echinated, unequal, sterile stigma. The *hermaphrodite* flowers are in axillary whorls, or on the joints of the smaller branches, sometimes mixed with the male flowers. The calyx, corolla, and stamens, are the same in both: the germen is globular, with a short style, and an inversely heart-shaped, 4-lobed, spreading, permanent stigma. The fruit is a smooth, globular, whitish, or rosaceous berry, crowned with the lobes of the style and stigma; and containing several long triangular seeds.

QUALITIES AND CHEMICAL PROPERTIES.—In Siam this gum-resin is obtained in drops, by wounding the shoots; in Ceylon it exudes from wounds in the bark. It is brought to Europe in large cakes, or rolls. Its colour is yellow; it is opaque, brittle, and breaks vitreous. It has no smell, and very little taste. With water it forms a yellow turbid fluid. Alcohol dissolves it almost completely, and when mixed with water becomes turbid, unless the solution contains ammonia: in that case, acids throw down an insoluble yellow precipitate. Its specific gravity is 1.221. It forms a fine yellow paint, and stains hot marble a beautiful lemon yellow.

Braconnot, on analysis, found it composed of one part of a gum possessing the properties of cherry-tree gum, and four parts of a reddish brittle resin. It dissolved in alcohol, and alkalies, and by nitric acid was converted into a yellowish bitter matter. Chlorine deprived it of its dark colour, and a combination took

place between it and muriatic acid, in which it neutralized that acid.

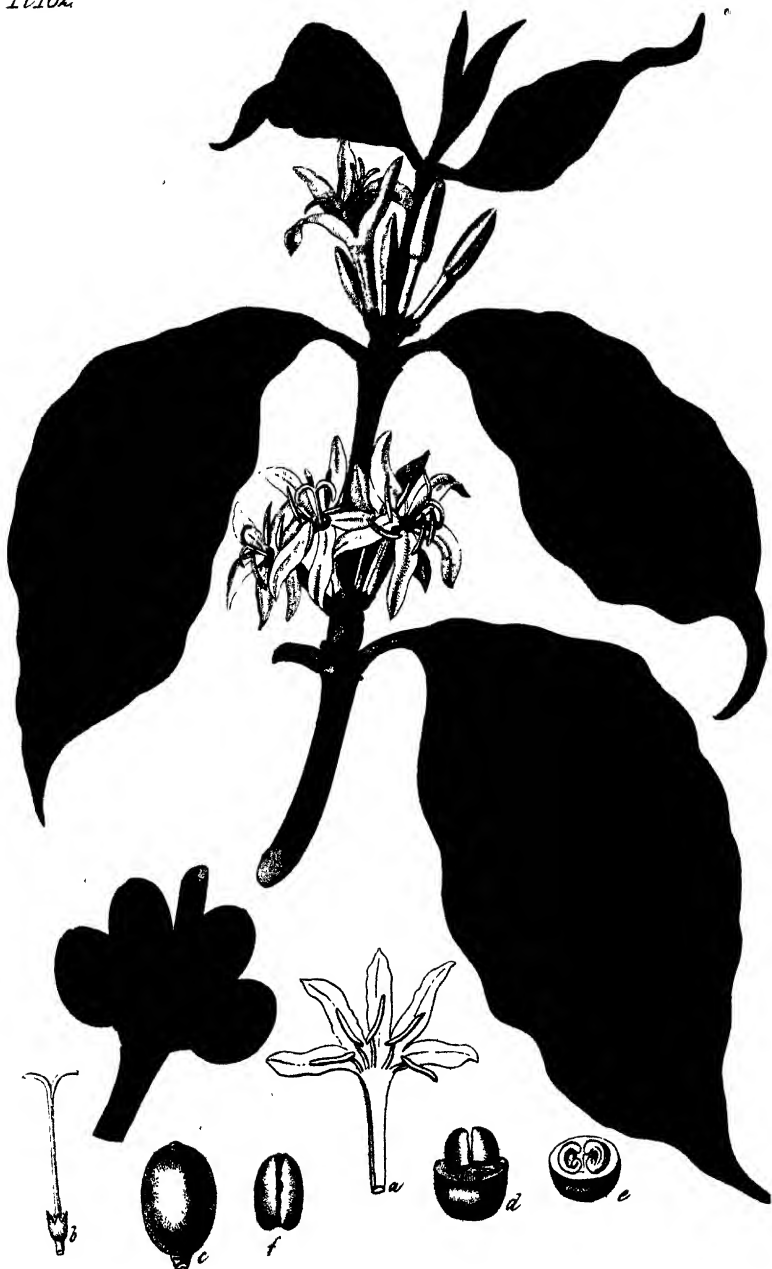
Gamboge is often adulterated with an inferior article, the produce of *GARCINIA Cambogia*, which is obtained from incisions made in the trunk, and in those roots which are exposed to the sun.

MEDICAL PROPERTIES AND USES.—Gamboge is a violent cathartic, and is apt to produce vomiting, griping, and tenesmus, which in certain constitutions have terminated in death, as proved in the conviction of two vendors of Morrison's pills; into the composition of which it enters pretty largely. To obviate its unpleasant effects Dr. Cullen was accustomed to give it in small and frequently-repeated doses, as three or four grains, rubbed with a little sugar, every three hours, and found it operate gently, evacuating, in three or four exhibitions, a great quantity of water, both by stool and urine. It is as a hydragogue purgative that it is prescribed in dropsical affections, and is then generally combined either with calomel, cream of tartar, or squills. It has been supposed to be peculiarly efficacious in expelling the tape-worm; but as a remedy in this case, its use is now very generally superseded by the oil of turpentine. It is soluble in a solution of potass, and is sometimes preferred in this form in doses of from thirty to forty drops, twice a day.

Orfila classes it amongst the acrid poisons, and considers that it does not produce death by its being absorbed, but by its exerting a powerful local action, in which the nervous system sympathizes.

DOSE.—The usual dose is from two to ten grains.

OFF. PREP.—*Pilulæ Cambogiæ compositæ*. L. E.



Coffea arabica.

COFFEA ARABICA:

Arabian Coffee-Tree.

Class V. PENTANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. STELIATÆ, *Lin.* RUBIACEÆ, *Juss.* COFFEIDÆ,
Burnett.

GEN. CHAR. *Calyx* 5-toothed ; teeth deciduous.
Corolla salver, or funnel-shaped. *Stamens* inserted
into the tube of the corolla. *Anthers* sagittate.
Berry 2-seeded. *Seeds* with an arillus.

SPEC. CHAR. *Leaves* oblong, ovate, acuminate. *Pe-
duncles* axillary, aggregate. *Corolla* 5-cleft.

Syn.—Bon vel Bam. *Alpin.* *Ægypt. ed.* 3. p. 36. t. 16 ; *Bauh. Hist.* 1. 422 ; *Pluck.
Alm.* 69 ; *Phyt.* t. 272. f. 1 ; *Park Theatr.* 1622.

Euonymo similis *Ægyptiaca*, fructu lauri simili. *Bauh. Pin.* 498.

Jasminum arabicum. *Till. Pis.* 87. t. 32 ; *Jussieu Act. Paris*, 1713. p. 291.
t. 7.

Coffea. *Hort. Cliff.* 59 ; *Blackw.* t. 37 ; *Lamarck Ill.* t. 160.

Coffea arabica. *Lin. Sp. Pl.* 245 ; *Willd.* v. 1. p. 973 ; *Gærtn. Fr.* 1. 118.
t. 25 ; *Hort. Kew.* 1. p. 374 ; *Bot. Mag.* v. 32. t. 1303 ; *Tussac. Fl. Antill.*
p. 121. t. 18.

FOREIGN.—*Caffayer arabique*, Fr. ; *Arabische Kafferbaum*, Ger. ; *Cay caphs*, Cochinoh.

FEW vegetable substances have been more generally esteemed for their medicinal and dietetic properties than the berries of the coffee-tree. The plant is fully described by Ellis and several other writers, and Gærtner has given an elaborate description of the fruit. The coffee-tree is generally regarded as a native of Arabia, but Bruce says, it derives its name from Caffee, a province of Narea, in Africa, where it grows spontaneously in great abundance. The plant does not appear to have been known to the Greeks or Romans, nor are there any facts on which we can rely respecting its origin in the East. It has been well ascertained, however, that the berries were imported into every part of Europe, and used as a favourite beverage, long before it was known of what plant they were the product. Prosper Alpinus had seen the coffee-tree, without fructification, in some gardens

in Egypt; but the first intelligible botanical account was published by Anth. de Jussieu, in the Memoirs of the Academy of Sciences in Paris, in 1713. We are informed by Boerhaave, in his "Index to the Leyden Garden," that it was first introduced into Europe by Nicholas Wisten, a burgomaster of Amsterdam, and chairman of the Dutch East India Company, who gave directions to the governor of Batavia, to procure seeds from Mocha in Arabia Felix. These being sown in the island of Java, several plants were procured, and one was transmitted by Wisten, about the year 1690, to the botanic garden at Amsterdam. From the progeny of this plant, not only the principal botanic gardens in Europe, but also the West India islands, were supplied with this valuable tree. Soon after its introduction into Holland, it was cultivated by Bishop Compton, at Fulham.

The coffee-plant is an evergreen shrub, rising from fifteen to twenty feet in height. The trunk is erect, seldom exceeding two or three inches in diameter, and covered with a brownish bark. The leaves are opposite, ovate-lanceolate, pointed, entire, wavy, smooth, shining; bright green on the upper surface, paler beneath, and placed on short petioles. At each knot of the branches are two awl-shaped, opposite, interfoliate stipules. The flowers are white, sweet-scented, sessile, disposed in clusters of four or five together, in the axillæ of the leaves, and soon falling off. The calyx is superior, very small, 5-toothed. The corolla is monopetalous, funnel-shaped, and divided into five lanceolate, spreading segments. The filaments are five, inserted into the tube of the corolla, and supporting yellow, linear anthers. The germen is ovate, inferior, bearing a simple style the length of the corolla, and two awl-shaped, reflexed stigmas. The berry is globular, about the size of a cherry, umbilicated at the summit, 2-celled, and containing a somewhat gelatinous pulp. The seeds are hemispherical, convex on one side, flat and furrowed longitudinally on the other, of a pale glaucous colour, and involved in a thin, elastic, pellucid aril. Fig. (a) exhibits a flower cut open; (b) the pistil with the calyx; (c) single berry; (d and e) different sections of the same; (f) the seed.

The coffee-tree is frequently cultivated in our gardens as an ornamental evergreen, and will both flower and ripen its fruit. It is propagated by the berries, which must be sown soon after they are gathered, or they will not vegetate. Being an intra-tropical plant, it must be kept in the stove, and should be allowed a free circulation of air, to prevent the attacks of insects.

In Arabia, the fruit is dried in the sun upon mats, and the outer coat is separated by means of a large stone cylinder. It is again placed in the sun, winnowed, and packed up in bales. In the West India islands, as soon as the fruit is of a deep red colour, it is reckoned to be ready for being gathered. A large linen bag, kept open by means of a hoop round its mouth, is suspended to the neck by the negroes, who pull the berries with their hands, and, after filling the bag, empty it into a large basket. A single negro can easily collect three bushels in a day. As the berries do not ripen together, they are collected at three different gatherings. One thousand pounds of good coffee is produced from one hundred bushels of *cherries* just from the tree. The coffee-berries may now be dried in two different ways. The first method is to place them in the sun, in layers of four inches thick, on inclined planes. In a few days, the pulp is discharged by fermentation, and in about three weeks the coffee is completely dry. The skin of the berries, already broken, is removed by mills, or in wooden mortars. The second method, is to separate the grain from the pulp at once, by means of a mill, and the grains are then left to soak in water for twenty-four hours. They are afterwards dried, and then stripped of the pellicle, or parchment, as it is called, by means of appropriate mills. The grains of coffee are afterwards winnowed, and mingled with the grindings and dust of the parchment, in which state they are put into bags for sale.

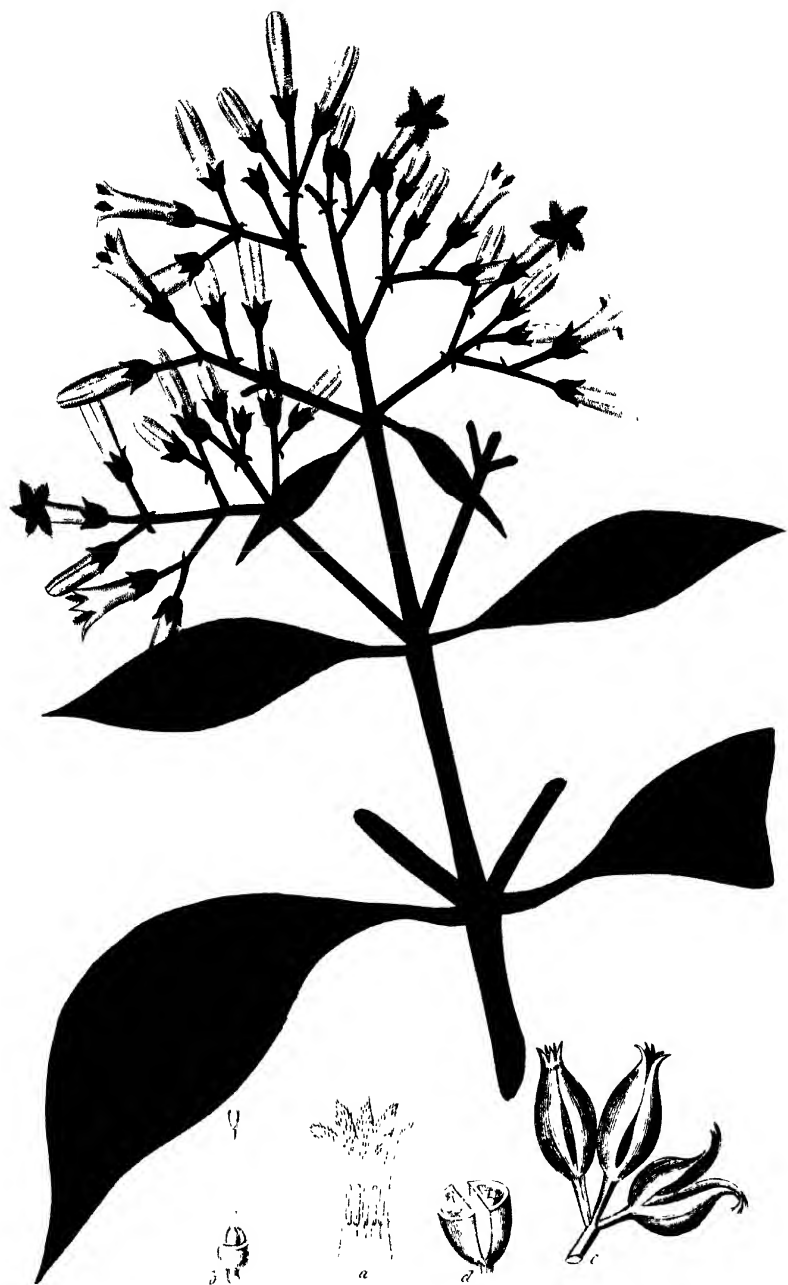
QUALITIES AND CHEMICAL PROPERTIES.—When the berries of coffee are roasted, a portion is converted into tannin by the action of the heat, and an agreeable aromatic substance is developed, the nature of which has not been ascertained. The same principle is also developed by roasting barley, beans, and many other vegetables, which, on that account, are occasionally em-

fresh, after the interval of a quarter of an hour, without milk or sugar.”*

As a general palliative, strong coffee is often serviceable in various kinds of head-ache, and where its own sedative power is unavailing, it forms one of the best vehicles for the administration of laudanum. It diminishes in some degree the hypnotic power of the latter, but counteracts its distressing secondary effects. When laudanum is intermixed with strong coffee for the cure of many modifications of head-ache, tranquillity and ease are produced, though there may be no sleep: when laudanum, on the contrary, is taken alone, sleep will, perhaps, follow, but is mostly succeeded by nausea, and a return of pain. Hence, the Turks and Arabians make strong coffee their common vehicle for opium, from its tendency to counteract the narcotic principle of the latter; and on the same account, it is plentifully administered after the stomach has been evacuated of its contents, in cases of poisoning by opium.

For common purposes, infusion of coffee is the most agreeable method of preparing it, as the aromatic and volatile principles are dissipated by boiling.

* See Perceval's Essays, vol. iii.



Cinchona condaminaea

CINCHONA CONDAMINEA.

Laurel-leaved Cinchona.

Class V. PENTANDRIA.—Order I. MONOGYNIA.

Nat. Ord. allied to *CONTORTÆ*, *Lin.* RUBIACEÆ, *Juss.*, *De Cand.* CINCHONACEÆ, *Burnett.*

GEN. CHAR. *Corolla* funnel-shaped. *Capsule* inferior, 2-celled, bipartite with a parallel partition, *Seed* winged.

SPEC. CHAR. *Leaves* ovate-lanceolate, smooth, shining, with a little pit in the axillas of the nerves on the under surface. *Segments* of the calyx ovate-acuminate; *limb* of the corolla woolly. *Stamens*, included. *Capsules* ovate.

Syn.—*Cinchona officinalis*. *Lin. Syst. Veg.* ed. 10. p. 924; *Condamine* in *Mém. de l'Acad. de Paris*, 1738, p. 114; *Lamarck Ill.* t. 146. f. 1; *Vuhl. Skript af Natur. Selfkab.* 1. t. 1.

Cinchona lanceolata. *Fl. Peruv.* 3. p. 1. t. 223.

Cinchona lancifolia. *Mutis Papel Periodici de Santa Fé*, p. 465; *ejud. Fl. Bogot.* MSS.

Cinchona nitida. *Fl. Peruv.* 2. p. 50. t. 191.

Cinchona angustifolia. *Ruiz. et Pavon, Quinol. Suppl.* p. 14. c. tab. f. a.

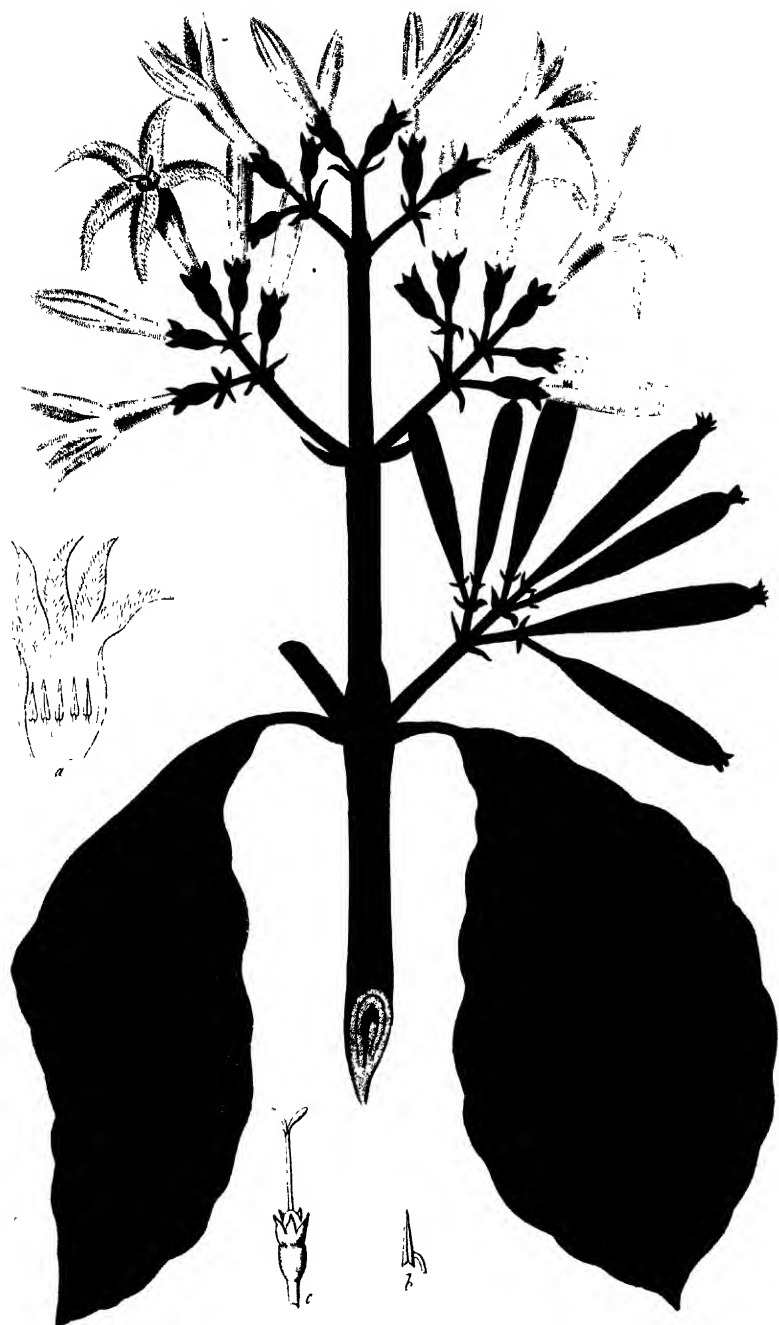
Cinchona glabra. *Ruiz. Quinol.* 2. p. 64.

Cinchona Condaminea. *Humboldt Pl. Æquinoct.* 133. t. 10; *Lambert Cinchon.* t. 1.

ALTHOUGH it is probable that several species of this important genus afford the Peruvian bark of the shops, of these three only are admitted into our national pharmacopœias, to which the specific names of *lancifolia*, (the *condaminea* of Humboldt and Bonpland,) *oblongifolia*, and *cordifolia*, have been applied, designating respectively, the pale, the red, and the yellow bark. Twenty-seven species have been described by botanists as natives of South America, the Phillipine, the West India, and the South Sea Islands.

The *Cinchona condaminea*, first described and figured by the astronomer Condamine, in 1738, in the *Mém. de l'Academie*, and named by Linnæus *officinalis*, is found on the mountainous forests,

at heights from 6,000 to 8,300 feet, where the mean temperature varies between 59 and 62 degrees, on a soil of micaceous schistus, in the neighbourhood of Loxa and Ayvaca, in the kingdom of Quito ; also, in New Granada, between Guaduas and Santa Fé de Bogota. It is described by Baron Humboldt as a lofty, handsome, evergreen tree, from thirty to forty feet in height, and standing generally single, and exuding, wherever it is wounded, a yellow, astringent juice. The trunk is about eighteen feet in height, and fifteen inches in diameter, erect, with a cracked ash-coloured bark. The branches are round, in opposite pairs, erect, brachiately, with the younger ones obscurely quadrangular at the sides. The leaves are of a bright green, shining, ovate-lanceolate, about three inches long, petiolate, with a little pit in the axillas of the nerves, or the under surface, which is filled with an astringent aqueous fluid, and having the orifice shut with minute hairs ; they stand on short footstalks, one-sixth of their length, flat above, and convex below ; but the form of the leaf varies extremely, so that no specific distinction can be derived from their figure alone. The stipules are two, acute, sericeous, contiguous, and caducous. The panicles are terminal, branched, leafy, and trichotomous. The flowers are of a pale rose-colour, furnished with little bracteas, and are produced in terminal, brachiately, leafy, trichotomous panicles, supported on round peduncles and pedicels, that are powdered and silky. The calyx is bell-shaped, globular, five-toothed, powdered, and silky, like the peduncles, with the teeth ovate, acute, very short, and contiguous. The corolla is somewhat salver-shaped, longer than the calyx, with the tube obscurely five-angled, silky, frequently of a rose-colour ; the limb wheel-shaped, with linear-lanceolate segments, much shorter than the tube, white, and woolly above. The anthers are twice the length of the free portion of the filaments. The germen is globular, with an erect style, and bifid stigma. The capsule is ovate, woody, striated longitudinally, crowned with the calycinal teeth, two-celled, many seeded, oppositely twice furrowed, and opening from the base to the apex with two valves.—Fig. (a) exhibits a flower cut open ; (b) germen and pistil ; (c) capsule ; (d) section of the same.



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CINCHONA OBLONGIFOLIA.

Oblong-leaved Cinchona.

SPEC. CHAR. *Leaves* broad, oblong, ovate, smooth and shining above, tomentose beneath. *Panicles* brachiate, corymbose, woolly. *Calyx* with short, acute teeth. *Segments* of the *corolla* lanceolate, spreading, hairy within. *Capsules* linear, cylindrical.

Syn.—*Cinchona magnifolia*. *Flor. Peruv.* 2. p. 52. t. 196 (non Humboldt et Bonpl.)

Cascarilla amarilla. *Ruiz Quinologia*, p. 71.

Cinchona oblongifolia (non Mutisii). *Humboldt Magaz. der Gesell Naturf. Freunde*, Berl. 1807, p. 118.

MM. RUIZ and Pavon, in their celebrated work, the “*Flora Peruviana et Chilensis*” inform us that this species of *Cinchona*, which is regarded as yielding the red bark of the shops, is found on the Andes, growing in woods on the banks of the mountain streams in great abundance, at Chinchao, Cuchero, and Chacahuassi; flowering in May, June, and July. As we have taken our figure of this plant from the above-mentioned work, we shall here also avail ourselves of the author’s accurate description.

The tree is spreading, much branched, and rises to the height of about forty feet. The trunk is single, erect, round, and covered with a somewhat smooth, brownish ash-coloured bark, internally yellow, and having a bitter, acidulous, not ungrateful taste. The older branches are round, smooth, and of a rusty colour; the younger are obtusely quadrangular, leafy, and of a diluted reddish hue. The leaves are opposite, large, the full-sized ones being one or two feet in length, of an oblong oval shape, and supported on short, roundish, purple petioles. They are entire, pale, and shining, on the upper surface; on the

under, transversed with several inflexed purplish veins; at the base of each are numerous bundles of white bristles; the stipules are supra-axillary, interfoliaceous, opposite, contiguous, united at the base, obovate, acuminate, and caducous. The flowers are produced in large, erect, compound, terminal panicles, somewhat branched, on long, brachiated, many-flowered peduncles. At the base of each flower-stalk are a pair of small ovate, pointed, deciduous bracteas. The calyx is small, five-toothed, and of a purple colour; the corolla scarcely an inch long, white, and fragrant, with the limb spreading, and hairy within. The filaments are very short, and inserted below the middle of the tube of the corolla, with oblong anthers, bifid at the base. The capsules are large, oblong, obscurely striated, slightly curved, and crowned with the calyx. The seeds are ovate, and surrounded with a rough, unequal, yellow margin.—Fig. (a) represents a flower cut open; (b) an anther detached; (c) the calyx, germen, and pistil.

Mr. Lambert, in his valuable “Illustration of the Genus Cinchona,” p. 11, says, “The celebrated authors of the ‘Flora Peruviana,’ have, in that work, confounded this species with that called by the natives *Flor de Azahar*, the *C. oblongifolia* of Mutis, a very different plant, the bark of which had been first sent to Spain by Don Sebastian Joseph Ruiz, a physician of Santa Fé de Bogota.* M. Bonpland has confounded it with his *C. caduciflora*, which he at first described under the name of *C. magnifolia* of the Flora Peruviana; but he very properly altered his opinion afterwards in his note to *C. scrobiculata*, *Plantæ Equinoct*, i. p. 167. The present species differs from Bonpland’s plant by the form of its leaves, by the acute teeth of its calyx, by its larger corolla, whose lanceolate lacininæ are equal to the length of the tube; by the anthers being included in the tube, by the style being exserted, and especially, by its linear cylindrical capsules.”

* Vernaculæ Flor de Azahar propter corolla odorem Citri florum odori simillimum. Hujus corticem D. Sebastianus Josephus Lopez Ruiz primus è Regno novo Granatensi in Hispaniam attulit, unde cum Galliæ, Italiæ, et Angliæ Academiis per clar. Casimirum Ortega communicatus est, ejusque usus variis experimentis institutis ubique propagatus. *Flora Peruv.* v. 2. p. 58.



CINCHONA CORDIFOLIA.

Heart-leaved Cinchona.

SPEC. CHAR. *Leaves* roundish-ovate, acute, heart-shaped at the base. *Panicles* brachiated, spreading, pubescent. *Calyx* 5-toothed; segments broad, roundish, terminating in short spines. *Stigma* 2-lobed. *Capsules* smooth, without ribs.

Syn.—*Cinchona species nova*, vulgo palo blanco. Pavon MSS.

Quina amarilla. Bogotensium.

Cinchona cordifolia. Mutus MSS.; Humboldt in *Magazin der Gessel. Naturf. Freunde*. Berl. 1807, p. 112; Rohde *Monogr.* p. 58; Humb. *Bonpl. et Kunth, Nova Gen. et Spec. Plant.* 3. p. 401; Lambert *Illustr.* p. 4.

THIS tree, the bark of which is known to the natives by the name of *Quina amarilla*, *Cascarilla de Loxa*, and *Cascarilla amarilla*, and is the yellow, or orange bark of the shops, is found on the mountains of Loxa, in the kingdom of Quito, and those of Santa Fé de Bogota, at heights from 900 to 1,440 toises; flowering from May to September. It is described as a middling-sized, spreading tree, having a single, round, erect stem, of moderate thickness, and covered with a smooth, brownish grey bark. The younger branches are quadrangular, smooth, leafy, sulcated, and tomentose. The leaves are large, opposite, spreading, somewhat roundish-ovate, pointed, or cordate, and attenuated at the base, entire, shining on the upper surface, ribbed, and pubescent on the under; with the petioles flat on one side, and roundish on the other, about an inch in length, and of a purple colour. The flowers appear in large, brachiated, leafy panicles, supported on long, compressed, tetragonous, downy peduncles. The calyx is five-toothed, downy, and of a dull purple colour, with the segments broad, roundish, and terminating in minute, awl-shaped spines. The corolla is hairy within;

the tube of a diluted red colour ; the limb shaggy, white above and purplish below, and the segments spreading, with reflexed tips. The filaments are short, supporting linear anthers, bifid at the base. The germen is tomentose, with a two-lobed stigma. The capsules are oblong, ovate, cylindrical, smooth, and without ribs. Our figure was made from a specimen in the cabinet of Aylmer Bourke Lambert, Esq. F.R.S., and Vice-President of the Linnæan Society, in whose magnificent herbarium, nearly the whole of the plants collected by the authors of the “ Flora Peruviana,” and their pupils, in Peru, Chili, and Mexico, consisting of five thousand seven hundred species, are now preserved. The specimens of this species were examined and named by M. Bonpland while in England. It differs from the *Cinchona purpurea*, *hirsuta*, and *ovata*, of the Flora Peruviana, and from the *C. pubescens* of Vahl, with which it has the greatest affinity ; it is distinguished by its shorter petioles, by the broader round teeth of its calyx, by the filaments being twice longer, and by its capsules being smooth and without ribs.

All the species of the genus *Cinchona* vary very much in the shape and smoothness of their leaves, according to the altitude in which they grow, to the severity or mildness of the climate, to the trees standing singly, or being closely surrounded by other plants, to the luxuriance of growth, and greater or less humidity of the soil. “ Whoever,” says Humboldt, “ determines single specimens of dried collections, and has had no opportunity to examine or observe them in their native forests, will, as is the case with the *Bronzonettia papyrifera*, be led to discover different species of leaves which are of one and the same branch. The yellow bark, *C. pubescens*, Vahl, we have found at one and the same time with *fol. ovato-oblongis*, *ovato-lanceolatis*, and *ovato-cordatis*. Mutis calls it *C. cordifolia*, because it is the only kind on which sometimes cordate leaves are found. The same species varies like the white *Cinchona C. ovalifolia*, Mut. (*C. macrocarpa* Vahl,) *foliis utrinque levibus*, and *foliis utrinque pubescentibus*. Even the laurel-leaved *C. condaminea*, the finest bark from Uritusinga, has very diversified leaves, according to the altitude at which it grows, and which equals that of

Saint Gothard's, or Mount *Ætna*." In the shoots and very young trees, we frequently find the leaves broad, ovate, and ovate-lanceolate. The older the tree is, the narrower are its leaves. In great luxuriance of growth, the little grooves frequently vanish, which appear on the upper surface of the leaf as convex glands. On very broad leaves, in which the parenchyma is considerably extended, they are almost entirely wanting. *C. cordifolia* has two varieties. Var. β *foliis vix cordatis utrinque glabris*; γ *foliis utrinque hirsutis*. By the common people in the kingdom of New Granada, it is called velvet bark. It grows under the fourth degree north latitude, in heights between 900 and 1,440 toises. Cordate leaves occur but seldom: however, almost every branch exhibits some of them.

Cinchona bark appears to have been long known as a medicine in Peru; but we have no satisfactory account at what period, nor by what means, the febrifuge virtues of this valuable remedy were first discovered. Some say, a patient had been cured of an intermittent fever by having drank the waters of a lake, which had acquired a bitter taste from Cinchona trees which had lain in them; others, that a lion had cured himself of the ague by instinctively chewing Cinchona bark, and had directed the attention of the Indians to this tree. "That animals," observes Humboldt, in his "Dissertation on the Cinchona Forests of South America," "have taught men, is a very common form of the traditions of nations. The valuable antidote *Bijuco del guaco*, a plant described by Mutis, which is related to the *Mikania*, and has been erroneously confounded with the *Ayapana* of Brasil, is also said to have attracted the notice of the Indians, as is affirmed of the *Falco serpentarius*, by the *Falco guaco* of New Granada fighting with serpents. However, that the great American lion, without mane, *Felis concolor*, should be subject to the ague, is just as bold an hypothesis as the assertion of the inhabitants of the pestilential valley, Gualla Bamba, (near to the town of Quito,) that even the vultures, *Vultur aura*, in their neighbourhood, were subject to that disorder. Indeed, in the regions of the Cinchona forests, there is not even a *Felis concolor* so fond of warmth to be found; but

at the most, the cat *Puma*, not yet properly described, and which we have met with in heights of 2,500 toises."

"The story, so often copied, respecting the Countess Chinchon, vice-queen of Peru, is probably still more doubtful than it is generally supposed to be. There certainly was a Count Chinchon, Don Geronimo Fernandez de Cabrera Bobadella y Mendoza, who was Viceroy of Lima, from 1629 to 1639. It is very probable that his wife, after her return to Spain, in 1640, was the first who introduced the Cinchona bark into Europe. The name of *Pulvis Comittissa* appears even more ancient than that of *Pulvis Jesuiticus*, or *Pulvis Patrum*. But I do not believe (and M. Olmedo, in "Loxa," is of the same opinion with me) that the corregidor of Loxa, Don Juan Lopez de Cannizares,* who is said to have cured the Countess of the ague, received this remedy from the Indians. In Loxa, there is no tradition whatever of this kind; nor is it probable that the discovery of the medicinal power of the Cinchona belongs to the primitive nations of America, if it is considered that these nations (like the Hindoos) adhere with unalterable pertinacity to their customs, to their food, and to their nostrums; and that, notwithstanding all this, the use of the Cinchona bark is entirely unknown to them in Loxa, Guancabamba, and far around. In the deep and hot valleys of the mountains of Catamango, Rio Calvas, and Macara, agues are extremely common. But the natives there, as well as in Loxa, of whatever cast, would die rather than have recourse to Cinchona bark, which, together with opiates, they place in the class of poisons exciting mortification. The Indians cure themselves by lemonades, by the oleaginous aromatic peel of the small, green, wild lemon, by infusions of *Scoparia dulcis*, and by strong coffee. In Malacatis only, where many bark-peelers live, they begin to put confidence in the Cinchona bark. In Loxa, there is no document to be found which can elucidate the history of the discovery of the Cinchona: an old tradition, however, is current there, that

* *Flora Peruviana*, tom. ii. p. 2.

the Jesuits, at the felling of the wood, had distinguished, according to the custom of the country, the different kinds of trees by chewing their barks, and that on such occasions they had taken notice of the considerable bitterness of the cinchona. There being always medical practitioners among the missionaries, it is said they had tried an infusion of the cinchona in the tertian ague, a complaint which is very common in that part of the country. This tradition is less improbable than the assertion of European authors, and among them the late writers, Ruiz and Pavon, who ascribe the discovery to the Indians. The medicinal power of the cinchona was likewise entirely unknown to the inhabitants of the kingdom of New Granada."

Cinchona bark is stripped from the trunk and branches in the dry season, from September to November; it is dried by exposure to the sun, and after being imported into Europe is sorted for sale. It is brought to this country in chests, each of which contains from one hundred to two hundred pounds weight of bark, mixed with dust, and other impurities. According to Humboldt, the quantity of this drug annually exported from America is 12,000 or 14,000 quintals. The kingdom of Santa Fé furnishes 2,000 of these, which are sent from Carthagena; 110 are furnished by Loxa; and the provinces of Huamanga, Cuenca, and Jean de Bracamoros, with the thick forests of Guacabamba and Ayavaca, furnish the rest, which is shipped from Lima, Guayaquil, Payta, and other ports on the south sea.

The *pale bark* of the shops, the *Quina Naranjada*, and *Cascarilla fina de Uritusinga* of the Spaniards, which is obtained from the *C. condaminea*, is preferred in South America to all the other species of bark. It is in pieces, five or six inches long, singly or doubly convoluted, externally of a greyish-brown colour, to which a crust of lichens often adheres, and is internally, when fresh broken, of a bright cinnamon hue. There are often intermixed with this, others of a coarser texture, thicker, and nearly flat, which appear to be obtained from the trunk and larger branches. The fracture is smooth and even; its powder is of a pale colour. Its taste is bitter and astringent; its smell peculiar, but aromatic. The *yellow bark*, named *Quina*

amarilla, *Cascarilla de Loxa*, and *Cascarilla amarilla*, is less rolled than the pale bark, and the pieces are larger and thicker. Externally it is of a greyish-brown colour, and covered with lichens; internally of a much deeper orange than the pale bark. It has a more bitter taste, with a less aromatic odour, and with scarcely any sensible degree of astringency. The *red bark* is sometimes rolled, but more commonly in flat thick pieces, covered with a rough, entire, reddish-brown epidermis. It has a smooth fracture. It is composed of three layers, the inner one being of a dark ferruginous colour. It is more bitter and astringent than the pale and yellow bark.

M. von Bergen, a drug broker at Hamburgh, who has written a valuable monograph on the Cinchonas, enumerates eight kinds of bark as distinguished in commerce: *—1. *China rubra*, red bark. This is almost universally regarded as the bark of the *C. oblongifolia*; but M. von Bergen is decidedly of opinion that the species which furnishes it is not yet ascertained, and that *C. oblongifolia* yields the *China nova* of Santa Fé. 2 *C. Huanuco*, silver Huanuco. This is said by Hayne to be the bark of *C. cordifolia*, but it is doubtful whether it does not belong to a new species. 3. *C. regia*, yellow bark, which M. von Bergen refers to an undescribed species. 4. *C. flava dura*, hard Carthagena bark. This Von Bergen considers, without doubt, as the bark of the *C. cordifolia*. 5. *C. flava fibrosa*, woody Carthagena bark, from an unknown species. 6. *C. Huamalies*, rusty bark, also derived from an unknown source. 7. *C. Loxa*, crown bark, so called from its having been destined for the Spanish court, and has only been in use since 1804. This is obtained principally from the *C. condaminea*. 8. *China jaen*, ash-coloured bark. 9. *China Pseudo-Loxa*, the bark of the *C. lancifolia* or of the *C. nitida*, and *lanceolata* associated with it. The first of these, the *China rubra*, contains both the alkaloids, with an excess of cinchonine. The *China Huanuco* contains only cinchonine; the *China regia*, *C. Loxa*, and *C. Huamalies*

**Versuche in der Monographie der China.* Von Henrich von Bergen. Ham. 1826.

contain only quinine, and the *flava* contains both alkaloids, with a superabundance of cinchonine.

QUALITIES AND CHEMICAL PROPERTIES.—Few vegetable substances have undergone so many analyses, by the most eminent chemists, as the different varieties of Peruvian bark. The basis of all of them is woody fibre, combined with which are various principles capable of being extracted by different solvents. The taste of all is more or less bitter and astringent. Boiling water extracts all their active principles; affording a solution of a pale brown colour; this infusion is transparent when hot, but on cooling becomes turbid, and a precipitate is deposited, which is soluble in alcohol. The decoction has a very astringent taste, and a deep brown colour. By long boiling, the virtues of the bark are nearly destroyed, owing to the chemical change and precipitation of its active matter. Alcohol, in all its modifications, is a powerful solvent of the active principles of cinchona. A saturated solution of ammonia is also a solvent of them, but acetic acid acts less imperfectly than even water. Vauquelin found that an infusion of the *pale bark* reddened litmus paper; was copiously precipitated by solution of galls, and in a smaller degree in yellowish flocculent flakes by solution of isinglass. A solution of tartar emetic was rendered turbid and slowly precipitated by it; solution of superacetate of lead produces quickly a copious precipitate. The addition of a solution of the sulphate of iron to the infusion, changed the colour to a bright olive-green, but was scarcely precipitated. The powder macerated in sulphuric acid afforded a golden-yellow tincture, which reddened litmus paper, and left a pellicle of bitter resin when evaporated on the surface of water, to which it gave the colour of the tincture. This coloured water did not precipitate the solution of galls and of tartar emetic, and occasioned no precipitate on the addition of the solution of sulphate of iron. With alcohol, it produced a deep orange-coloured tincture, which precipitated sulphate of iron, tartarized antimony, and tannin. The agency of the different menstrua on the red and yellow varieties of the cinchona, produce nearly the same results as on the com-

mon or pale bark. The filtered solution of yellow bark has a pale golden hue, with a shade of red; it is bitter, reddens litmus paper, and precipitates solution of galls. On adding a solution of isinglass, a pinkish yellow precipitate is produced; superacetate throws down a precipitate; tartarized antimony gives a precipitate in pale yellowish flakes. A solution of the sulphate of iron changes its colour to a bluish green, and slowly lets fall a precipitate of the same colour. The alcoholic tincture appears to be in every respect the same as that afforded by the pale bark. The *red bark* has a more nauseous taste than the barks of the other species. The aqueous infusion is of a pale ruby colour; its action on the solutions of galls and of isinglass, is nearly the same as that of the two former species, but it is not altered by tartarized antimony, nor by the superacetate of lead; and the solution of iron occasions a dirty yellow colour only, little being precipitated. The alcoholic tincture is of a deep brownish-red colour, and precipitates the solution of the sulphates of iron, and of tartarized antimony, the former of a black colour, and the latter red. From the experiments of Vauquelin, Fabroni, and others, it appears that the active principles of cinchonas consist chiefly of cinchonine, resin, extractive, gluten, a very small portion of volatile oil, and tannin. Vauquelin has determined the presence of a peculiar acid, to which he gives the name of *kinic* acid, in some varieties of the bark. The following are the most important results that have been obtained by MM. Pelletier and Caventou, respecting the composition of the three officinal species:—1. In *pale bark*, they found acidulous kinate of cinchonine, a green fatty matter which they term red cinchonine, tannin, a yellow colouring matter, kinate of lime, gum, starch, and woody fibre. 2. In *yellow bark* they found that the alkaline base differs from cinchonine, in being uncrystallizable, very soluble in ether, and forming salts with the acids different from those formed by cinchonine. The chemical constituents of *yellow bark* are, an acidulous kinate of this salt, which they have named *quinine*, a deep yellow, fatty matter, red cinchonine, tannin, yellow colouring matter, kinate of lime, starch, and woody fibre. 3. *Red bark*

contains acidulous kinate of cinchonine, kinate of quinine, reddish fatty matter, red cinchonine, tannin, kinate of lime, yellow colouring matter, starch, and woody fibre. The difference between the pale, the red, and the yellow barks, depends principally on the quantity of the two alkaline bodies, *cinchonine* and *quinine*, found in them. The pale bark contains cinchonine, but a very small portion of quinine; the alkali, again, which predominates in the yellow bark, is quinine, while in the red bark, and some spurious kinds, there is a combination of both these substances. The presence of cinchonine, as a distinct vegetable principle, was first discovered in Peruvian bark by Dr. Duncan of Edinburgh.

The separation of the *cinchonine* from the pale bark, and of the *quinine* from the yellow, is a very simple operation. It consists in digesting the bark, coarsely powdered in weak sulphuric acid, and then to repeat this digestion with about half the quantity of liquid, till all the soluble matter is extracted. To this decoction a small quantity of powdered slacked lime is added, somewhat greater than is necessary to saturate the acid; the precipitate that ensues (a mixture of cinchonine and the sulphate of lime) is collected, dried, and boiled for a few minutes in alcohol, which takes up the cinchonine, but will not dissolve the sulphate of lime; the solution is decanted off *while still hot*, and fresh portions successively added for the repetition of the same operation, until it ceases to act on the residuum, which is then merely sulphate of lime. The different alcoholic solutions are then put into a retort, and considerably evaporated, during which, and on cooling, acicular crystals of cinchonine are deposited. By repeating the solution once or twice in boiling alcohol, and again crystallizing, the cinchonine will be obtained in a perfectly pure state. Its crystals are semi-transparent, have a pearly lustre, and are usually obtained in the form of small needles. It has but little taste, and requires 700 parts of water for its solution, but boiling alcohol dissolves it much more abundantly; it is sparingly soluble in oils, and sulphuric ether. At a moderate heat it is partly volatilized, and partly decomposed. It combines with different acids, forming neutral salts. Mr.

Brande found that it contains no oxygen, 100 parts consisting of about 86 parts of carbon + 13 of nitrogen + 7 hydrogen. It has an intensely bitter taste, and exerts the same action on the animal economy as the bark itself, but it is less generally used in medicine than the other active principle of bark, quinine, because the yellow bark from which it is procured is more plentiful; the quinine, therefore, is cheaper than cinchonine, and equally efficacious.

Quinine may be obtained from the yellow bark in the same manner as cinchonine is prepared from the pale bark, or by adding an alkali to a solution of the sulphate of quinine. Quinine is not crystallizable like cinchonine, but on the application of heat it melts into a kind of paste. It has a much more bitter taste than the other, and is very sparingly soluble in water. They differ also remarkably in their chemical composition, cinchonine containing no oxygen, while in quinine there is a notable proportion of this element. According to Mr. Brande, it consists of about 5.55 parts of oxygen + 7.65 hydrogen + 13 nitrogen + 73.80 carbon. By digesting quinine in a weak solution of sulphuric acid, we obtain the *sulphate of quinine*, which is the salt now generally used for medicinal purposes. The most approved process for preparing this salt was pointed out by M. Henry. A kilogramme of bark (2 lbs. 3 oz., 5 dr.) is reduced to a coarse powder, and boiled twice for about a quarter of an hour in fourteen or fifteen pints of water, two ounces of sulphuric acid being added to it each time. The decoctions containing the sulphate of quinine are of a reddish colour, which gradually acquire a yellow tint, and have a very strong bitter taste. They are to be filtered through a linen cloth, and about half a pound of powdered quicklime added to the solution. The sulphate of quinine is decomposed in this manner, the alkali being precipitated along with the sulphate of lime. This is digested repeatedly in alcohol, till it no longer imparts any bitter taste to this fluid: the alcoholic solutions are then evaporated till a very bitter viscid substance is obtained, which becomes brittle as it cools. This is the quinine separated from almost all the other ingredients of the bark; and by digest-

ing it in dilute sulphuric acid, a solution of the sulphate of quinine is obtained, which crystallizes on evaporation. It is a white pulverulent substance; it crystallizes in small white 4-sided prisms, which are distinguished by their pearly lustre. It is not very soluble, therefore not affording a very bitter taste; but by adding a drop or two of acid to the solution, its solubility is increased, and it then becomes intensely bitter. It is decomposed by the alkalies and earths; it volatilizes at a moderate heat, and it can unite with an excess of acid, forming a *bisulphate of quinine*.

The sulphate of quinine is frequently adulterated with starch, pipe-clay, and various other substances. To determine its purity, the simple process of heating it is sufficient: if it evaporate entirely, without charring and melting, it is pure; but if it should turn black, or smell sweetish, it is probable that sugar or starch is present.

Pure quinine is seldom used in medicine, but the sulphate possesses, in a very eminent degree, the medicinal properties of Peruvian bark, one grain, or one grain and a half, being equivalent to a drachm of the bark in substance. It has superseded in a great measure the Peruvian bark, and is now extensively used in all cases where that valuable medicine is indicated, in doses of from two to five grains.

MEDICAL PROPERTIES AND USES.—Peruvian bark has been long known as one of the most powerful and valuable tonics we possess, and may be administered with great freedom in all cases where that class of remedies is indicated. The only effects of an overdose, are headach and nausea. It also possesses anti-septic and astringent powers in a very eminent degree, and is universally employed as a febrifuge in the cure of intermittent and remittent fever, in diseases of debility, such as typhus, cynanche maligna, in passive hæmorrhagies, confluent small-pox, in dysentery, in some cutaneous diseases, as lichen agrius and livida, in purpura, in some varieties of erysipelas, in gangrene, in dyspepsia, and even in acute rheumatism and gout. The decoction of yellow cinchona bark given in large quantities, is the best antidote to the poison of tartar emetic.

"The effects," says Dr. Murray, "of Peruvian bark are those of a powerful and permanent tonic, so slow in its operation as to be scarcely perceptible by any alteration in the state of the pulse, or of the temperature of the body. Its tonic power is inferred, therefore, principally from obviating states of debility; and it is one of those medicines, the efficacy of which in removing disease, is much greater than could be expected, *a priori*, from its effects on the system in a healthy state. The only effects arising from too large a dose are nausea and head-ach.

"Intermittent fever is the disease for the cure of which bark was introduced into practice, and there is still no remedy which equals it in power,—a superiority of which, from its known operation, it is difficult to give any explanation. Little diversity of opinion now exists with regard to the rules regulating its administration. It is given freely in the earliest stage of the disease, and without any previous preparation, farther than the exhibition of an emetic to evacuate the stomach. And it may be employed with safety and advantage in every period of the fever. It has been supposed rather more effectual when given before the recurrence of the paroxysm, and that, from this mode of employing it, less is required for the cure. The usual practice, however, is to give it in doses of a scruple or half a drachm every fifth or sixth hour during the interval of the paroxysm; it may be even given with safety during the hot fit, but is then more apt to excite nausea. It requires to be given for some time, and continued after the fever has been removed, in order more effectually to guard against a relapse.

"In remittent fever it is given with equal freedom, even though the remission of the fever may be obscure, and frequently with advantage. The remissions become more distinct, and the febrile state is at length subdued.

"In those forms of continued fever which are connected with debility, as in typhus, cynanche maligna, and confluent small-pox, &c. Peruvian bark has been regarded as one of the most valuable remedies. It is difficult, however, to give it in such quantities as to obtain much sensible effect from it, as from the weakened state of the organs of digestion, it remains in the stomach unaltered, and is liable to produce nausea and irritation. In modern practice, therefore, bark is less employed in typhus, preference being given to the more powerful exciting operation of opium and wine. It has been regarded as even hurtful in those forms of fever, where the brain or its membranes are inflamed, or where there is much irritation, marked by subsultus tendinum, and convulsive motions of the extremities. Advantage is sometimes derived from it in the convalescent stage of the disease.

"Even in fevers of an opposite type, where there are marks of inflammatory action, particularly in acute rheumatism, bark has been found useful, blood-letting being generally previously employed.

"In erysipelas, in gangrene, in extensive suppuration, and in scrofulous and venereal ulceration, the free use of cinchona has been regarded as of the greatest advantage. In some of these diseases, however, the slowness of its operation renders it less effectual, and this is not easily obviated by any increase which can be made in the dose.

"In the various forms of passive hæmorrhagy, in many other diseases of chronic debility, dyspepsia, hypochondriasis, paralysis, rickets, scrofula,

dropsy, and in a variety of spasmodic affections, epilepsy, chorea, and hysteria, cinchona is administered as a powerful and permanent tonic, either alone, or combined with other remedies suited to the particular case. The more common combinations of it are with sulphuric acid as an astringent, with preparations of iron as a tonic, with mercury in syphilis, in spasmodic diseases with valerian, and with cicuta in scrofula and extensive ulceration.

“ Its usual *dose* is half a drachm. The only inconvenience of a larger dose is its sitting uneasy on the stomach. It may, therefore, if necessary, be frequently repeated, and in urgent cases may be taken to the extent of an ounce or even two ounces in twenty-four hours, though from such large doses probably no adequate advantage is derived. If it excite nausea, smaller doses may be taken and repeated more frequently, and may be reconciled to the stomach by the addition of any grateful aromatic.”

OFF. PREP.—Decoctum Cinchonæ, L. E. D.

Infusum Cinchonæ, L. E. D.

Extractum Cinchonæ, L. E. D.

Ext. Cinchonæ resinosum, L. D.

Tinctura Cinchonæ, L. E. D.

Tinctura Cinchonæ, Comp. L. D.

Vinum Gentianæ, Comp. F.

T A B U L A R I N D E X
OF THE
L A T I N N A M E S.

TABULAR INDEX OF THE LATIN NAMES.

The following Table exhibits at one view the name, duration, and habit of each plant, the class and order to which it belongs in the Linnean system, the natural order, the time of flowering, native country, the part used, its operation, medical properties and uses, and the volume in which the figure and description are given. The sign ♀ signifies that the plant is a shrub or tree; ♂ that it is a perennial; ☉ that it is an annual; ♂ that it is biennial.

Name, Duration, and Habit.	Volume and Plate.	Class and Order.		Time of Flowering.	Native Country.	Parts Used.	Operation.	Uses.
		Linneæ.	Jussieu.					
cacia Catechu ♀ . . .	ii. 76.	Polygam. Monœc.	Leguminosæ.	June.	E. Indies.	Extract.	Astringent.	In diarrhœa, dysentery.
cacia vera ♀ . . .	ii. 77.	—	—	July.	Africa.	Gum.	Demulcent.	Coughs, diarrhœas.
conitum Napellus ♂ . .	i. 28.	Polyand. Pentagyn.	Ranunculacææ.	June, July.	Germany.	Leaves.	Narcotic, diuretic.	Rheumatism, scirrhus.
corus Calamus ♂ . . .	i. 32.	Hexand. Monogyn.	Aroidæ.	June.	England.	Root.	Stomachic.	Dyspepsia, flatulent colic.
Æsculus Hippocastanum ♀	ii. 68.	Heptand. Monogyn.	Acera.	May.	N. of Asia.	Bark.	Tonic.	Intermittent fevers.
Æthusa Cynapium ☉ . .	i. 8.	Pentand. Digyn.	Umbellifera.	June, July.	Britain.	Not used.	Acro-narcotic poison.	Not used medicinally.
garicus bulbosus . . .	iii. 166.	Cryptogam. Fungi.	Fungi.	....	—	—	As above.	As above.
garicus semiglobatus . .	iii. 163.	—	—	....	—	—	—	—
Illium sativum ♂ . . .	ii. 111.	Hexand. Monogyn.	Asphodeli.	July.	Sicily.	Bulb.	Expectorant, anthelmintic.	Asthma, worms,
loe Socotrina ♂ . . .	ii. 110.	—	—	—	Africa.	Extract.	Cathartic, anthelmintic.	Dyspepsia, chlorosis, worms, &c.
loe vulgaris ♂ . . .	ii. 109.	—	—	May, June.	Levant.	—	As above.	As above.

Duration, and Habit.	Volume and Plate.	Class and Order.		Time of Flowering.	Native Country.	Parts Used.	Operation.	Uses.
		<i>Linæus.</i>	<i>Jussieu.</i>					
<i>officinalis</i> 2l	i. 51.	Monadelph. Polyand.	Fungi.	July, Sept.	Britain.	Leaves&Root.	Demulcent.	In coughs, nephritis.
<i>a muscaria</i> .	iii. 163 & 164.	Cryptogam. Fungi.	Malvaceæ.	—	—	Pileus.	Acro-narcotic poison.	Not used medicinally.
<i>alus communis</i> ½	i. 43.	Icosand. Monogyn.	Rosaceæ.	March, Apl.	Barbary.	Kernel.	Demulcent, sedative.	In coughs.
<i>gileadensis</i> ½	iii. 157.	Octand. Monogyn.	Terebinthaceæ.	—	Arabia.	Balsam.	Stimulant, expectorant.	Pulmonary complaints.
<i>lis arvensis</i> ☉	i. 16.	Pentand. Monogyn.	Lysimachiæ.	June, July.	Britain.	Not used.	Acrid, poisonous.	Not used medicinally.
<i>sa tinctoria</i> 2l	ii. 122.	—	Boraginæ.	June, Oct.	S. of Europe.	Root.	Astringent.	To colour oils.
<i>um graveolens</i> ♂	iii. 137.	Pentand. Digyn.	Umbellifereæ.	June, July.	Britain.	Seeds.	Carminative.	Flatulent colic.
<i>ca Archangelica</i> ♂	ii. 83.	—	—	June, Sept.	—	Root.	Tonic, stimulant.	Dyspepsia.
<i>nis nobilis</i> 2l	i. 38.	Syngenes. Poly. S.	Corymbifera,	Aug. Sept.	—	Flowers.	Stomachic, emetic.	Dyspepsia, hysteria.
<i>nis Pyrethrum</i> 2l	ii. 97.	—	—	June.	S. of Europe.	Root.	Sialagogue.	Toothache, dysphagia.
<i>is Uva Ursi</i> ½	ii. 91.	Decand. Monogyn.	Ericæ.	—	Britain.	Leaves.	Astringent, tonic.	Calculus, catarrhus vesicæ.
<i>ochia Serpentaria</i> 2l	iii. 180.	Gynand. Hexand.	Aristolochiæ.	May, June.	N. America.	Root.	Tonic, diaphoretic.	Dyspepsia, typhus.
<i>montana</i> 2l .	ii. 123.	Syngenes. Polyg. S.	Corymbifera.	June, July.	Europe.	Flowers&root.	Narcotic, diaphoretic.	Paralysis, rheumatism.
<i>isia Absinthium</i> 2l .	i. 58.	—	—	August.	Britain.	Leaves & tops.	Tonic, anthelminthic.	Dyspepsia, worms.
<i>isia maritima</i> 2l .	i. 58.	—	—	—	—	Tops.	as above.	Same as above.
<i>isia Santonica</i> 2l .	i. 58.	—	—	September.	Persia.	Tops.	Stimulant, anthelminthic.	Worms, chlorosis.
<i>maculatum</i> 2l .	i. 22.	Monœc. Polyand.	Aroideæ.	May.	Britain.	Recent root.	Stimulant, expectorant.	Rheumatism, asthma.

Name, Duration, and Habit.	Volume and Plate.	Class and Order.		Time of Flowering.	Native Country.	Parts Used.	Operation.	Uses.
		<i>Linneæ.</i>	<i>Jussieu.</i>					
<i>Asarum europæum</i> 24 .	i. 23.	Dodecand. Monogyn.	Aristolochiz.	May.	Britain.	Leaves.	Emetic ; errhine.	In cephalic snuffs.
<i>Asaragulus creticus</i> 2 .	iii. 161.	Diadelph. Decand.	Leguminosæ.	—	Greece.	Gum.	Demulcent.	Coughs, diarrheas.
<i>Atropa Belladonna</i> 24 .	i. 1.	Pentand. Monogyn.	Solanæ.	June, July.	Britain.	Leaves.	Narcotic.	Scurrhous, cancer, neuralgia.
<i>Asoplandia trifoliata</i> 2 .	iii. 149.	—	Simarubæ.	....	S. America.	Bark.	Tonic, stimulant.	Dyspepsia, dysentery.
<i>Asoswellia serrata</i> 2 .	iii. 147.	—	Meliss.	....	E. Indies.	Gum-resin.	Stimulant.	Chiefly in plasters.
<i>Asyonia dioica</i> 24 .	i. 64.	Monæc. Pentand.	Cucurbitaceæ.	May, Sept.	Britain.	Root.	Cathartic, diuretic.	Dropsies, mania.
<i>Asanella alba</i> 2 .	ii. 66.	Dodecand. Monogyn.	Meliaceæ.	....	W. Indies.	Bark.	Stimulant, tonic.	Dyspepsia.
<i>Asapsicum annuum</i> 2 .	i. 44.	Pentand. Monogyn.	Solanæ.	July, Aug.	Both Indies.	Seeds.	Stimulant, rubefacient.	Atonic gout, paralysis.
<i>Asarum Carui</i> 2 .	i. 59.	Pentand. Digyn.	Umbellifera.	June.	Europe.	—	Carminative.	Dyspepsia, colic.
<i>Asasia Fistula</i> 2 .	iii. 155.	Decand. Monogyn.	Leguminosæ.	May, June.	Both Indies.	Pulp.	Laxative.	Constipation.
<i>Asasia Senna</i> 2 .	i. 30.	—	—	July, Aug.	Egypt.	Leaves.	Cathartic.	Constipation, dropsy.
<i>Asentaurea benedicta</i> 2 .	iii. 128.	Syngenes. Frust. F.	Cinarocephalæ.	June, Sept.	S. of Europe.	—	Tonic.	Dyspepsia, gout.
<i>Asaphæalis Ipecacuanha</i> 24 .	i. 63.	Pentand. Monogyn.	Aggregatæ.	Dec. March.	Brasil.	Root.	Emetic, expectorant.	Fevers, asthma, dysentery.
<i>Asetraria islandica</i> 24 .	ii. 69.	Cryptogam. Algæ.	Lichenes, Hoff.	....	Britain.	Herb.	Nutritive, demulcent.	Coughs, phthisis.
<i>Aselidontium majus</i> 24 .	ii. 86.	Polyand. Monogyn.	Papaveraceæ.	May, June.	—	Juice.	Acrid, poisonous.	To destroy warts.
<i>Asenopodium olidum</i> 2 .	iii. 176.	Pentand. Digyn.	Atriplices.	August.	—	Extract.	Antispasmodic, emmenagogue.	Amenorrhœa, hysteria, chlorosis.
<i>Ascuta virosa</i> 24 .	ii. 89.	—	Umbellifera.	—	—	Not used.	Acro-narcotic poison.	Not used medicinally.

, Duration, and Habit.	Volume and Plate.	Class and Order.		Time of Flowering.	Native Country.	Parts Used.	Operation.	Uses.
		<i>Linneæ.</i>	<i>Jussieu.</i>					
<i>ma Condaminea</i> ½ .	iii. 183.	Pentand. Monogyn.	Rubiaceæ.	August.	Quito.	Bark.	Tonic, antiseptic, febrifuge.	In intermittent an continued fevers, cycnanche maligna, aphacellus, and general debility.
— cordifolia ½ .	iii. 185.	—	—	May, Sept.	Peru.	—	—	
— oblongifolia ½ .	iii. 184.	—	—	May, July.	Quito.	—	—	
<i>Aurantium</i> ½ .	i. 14.	Polyadel. Icosand.	Aurantii.	May, Aug.	India.	Rind.	Stomachic.	Dyspepsia.
<i>medica</i> ½ . .	ii. 92.	—	—	—	Asia.	Rind, oil, juice.	Refrigerant, stomachic.	Fevers, scurvy; bark in dyspepsia.
<i>lus palmatus</i> ¼ .	iii. 160.	Dicæ. Hexand.	Menispermææ.	....	Africa.	Root.	Tonic, stomachic.	Dyspepsia, cholera.
<i>earia Armoracia</i> ☉	ii. 114.	Tetradyn. Silicul.	Siliculosææ.	May.	Britain.	Root.	Stimulant, rubefacient.	Paralysis, rheumatism.
<i>a arabica</i> ½ . .	iii. 182.	Pentand. Monogyn.	Rubiaceæ.	Aug. Oct.	Arabia.	Seeds.	Antispasmodic.	Asthma, &c.
<i>icum autumnale</i> ¼ .	ii. 70.	Hexand. Trigyn.	Junci.	September.	Britain.	Bulb.	Narcotic, diuretic.	Gout, rheumatism.
<i>um maculatum</i> ♂ .	i. 13.	Pentand. Digyn.	Umbelliferaæ.	June, July	—	Leaves.	Narcotic.	Cancer, scrofula.
<i>olvulus Jalapa</i> ½ .	— 47.	Pentand. Monogyn.	Convolvuli.	Aug. Sept.	Mexico.	Root.	Cathartic, hydragogue.	Dropsy, worms.
— Scammonia ½	— 60.	—	—	—	Syria.	Gum-resin.	As above.	As above.
— sepium ¼ .	— 2.	—	—	July, Aug.	Britain.	Extract.	—	—
<i>ifera officinalis</i> ½ .	iii. 158.	Decand. Monogyn.	Leguminosææ.	....	S. America.	Balsam.	Stimulant, diuretic.	Gonorrhœa, fluor albus.
<i>indrum sativum</i> ☉ .	ii. 94.	Pentand. Digyn.	Umbelliferaæ.	June.	Britain ?	Seeds.	Carmative.	Flatulent colic.
<i>us sativus</i> ¼ . .	— 101.	Triand. Monogyn.	Iridææ.	October.	—	Stigmas.	Stimulant.	Chiefly used for colouring.
<i>on Eleuteria</i> ½ .	iii. 150.	Monoc. Monadel.	Euphorbiaæ.	....	Bahamas.	Bark.	Stimulant, stomachic.	Dyspepsia, colic, dysentery.

Name, Duration, and Habit.	Volume and Plate.	Class and Order.		Time of Flowering.	Native Country.	Parts Used.	Operation.	Uses.
		<i>Linnaea.</i>	<i>Jussieu.</i>					
<i>Croton Tiglium</i> L. . .	i. 4.	Monoc. Monadelph.	Euphorbiae.	....	Moluccas.	Oil.	Drastic, cathartic.	In apoplexy, mania.
<i>Cucumis Colocynthis</i> C. .	iii. 138.	Monoc. Syngenes.	Cucurbitaceae.	May, Aug.	Cape of Good Hope.	Pulp.	Drastic, cathartic.	Dropsy, mania.
<i>Curcuma Zedoaria</i> Z. .	ii. 107.	Monand. Monogyn.	Cannae.	....	Ceylon.	Root.	Carminative, tonic.	Dyspepsia, colic.
<i>Daphne Mezereum</i> L. .	— 65.	Octand. Monogyn.	Thymeleae.	March.	Britain.	Bark of the root.	Diaphoretic.	Rheumatism, lepra.
<i>Datura Stramonium</i> C. .	i. 6.	Pentand. Monogyn.	Solaneae.	July.	N. America.	Herb.	Narcotic, antispasmodic.	Asthma, mania, epilepsy.
<i>Daucus Carota</i> L. . .	— 56.	Pentand. Digyn.	Umbelliferae.	June, July.	Britain.	Root & seeds.	Antiseptic, diuretic.	As a cataplasm to ill-conditioned ulcers.
<i>Delphinium Staphisagria</i> L. .	— 55.	Polyand. Trigyn.	Ranunculaceae.	April, Aug.	Greece.	Seeds.	Violently emetic, &c.	To destroy pediculi.
<i>Digitalis purpurea</i> L. . .	— 18.	Didynam. Angiosp.	Scrophulariae.	June, July.	Britain.	Leaves.	Sedative, diuretic.	Phthisis, dropsies.
<i>Diosma crenata</i> Z. . .	ii. 121.	Pentand. Monogyn.	Rutaceae.	August.	Cape of Good Hope.	—	Sudorific, diuretic.	Catarhus vesicae.
<i>Dolichos pruriens</i> Z. . .	iii. 179.	Didynam. Decand.	Leguminosae.	Sept. Mar.	Both Indies.	Hairs of the pods.	Anthelmintic.	Worms.
<i>Dorstenia Contrayerva</i> Z. .	— 155.	Monoc. Diand.	Urticeae.	May, Aug.	S. America.	Roots.	Stimulant, sudorific.	Typhus, dysentery.
<i>Dryobalanops Camphora</i> L. .	— 170.	Polyand. Monogyn.	Guttiferae.	....	Sumatra.	Camphor.	Narcotic, diaphoretic.	Typhus, variola, granigrene.
<i>Eryngium maritimum</i> Z. .	— 143.	Pentand. Digyn.	Umbelliferae.	July, Aug.	Britain.	Roots.	Aperient, aphrodisiac?	Probably inert.
<i>Erythraea Centaurium</i> Z. .	ii. 118.	Pentand. Monogyn.	Gentianeae.	—	—	Herb.	Stomachic, tonic.	Dyspepsia, intermittentis.
<i>Eugenia caryophyllata</i> L. .	— 95.	Icosand. Monogyn.	Myrti.	June, Jan.	Moluccas.	Flower buds.	Stimulant.	Dyspepsia, atonic gout.
<i>Euphorbia officinarum</i> L. .	iii. 142.	Dodecand. Trigyn.	Euphorbiae.	June, July.	Africa.	Gum-resin.	Errhine.	Amaurosis, lethargy.
<i>Ferula persica</i> Z. . .	— 169.	Pentand. Digyn.	Umbelliferae.	June.	Persia.	—	Antispasmodic.	Hysteria, dyspnoea, worms.

Name, Duration, and Habit.	Volume and Plate.	Class and Order.		Time of Flowering.	Native Country.	Parts Used.	Operation.	Uses.
		<i>Linnaeus.</i>	<i>Jussieu.</i>					
<i>Ficus Carica</i> ♀ .	iii. 154.	Polygyn. Triec.	Urticæ.	June, July.	Asia.	Fruit.	Nutritive, demulcent.	In Decoction for coughs.
<i>Fraxinus Ornus</i> ♀ .	i. 53.	Polygyn. Diœc.	Jasminææ.	May.	Italy.	Manna.	Laxative.	Constipation in children
<i>Fucus Helminthocortos</i> ♂	ii. 108.	Cryptogam. Algæ.	Algæ.	....	Britain.	Herb.	Anthelmintic ?	In worms.
— <i>vesiculosus</i> ♂	—	—	—	Mar. April.	—	Fruit.	Discutient.	Scrofulous swellings.
<i>Garcinia Cambogia</i> ♀	iii. 181.	Dodecand. Monog.	Guttifera.	March.	Malabar.	Gum-resin.	Cathartic, hydragogue.	Dropsy, tenia.
<i>Gentiana lutea</i> ♂ .	— 132.	Pentand. Digyn.	Gentianææ.	June, July.	Germany.	Root.	Stomachic, tonic.	Dyspepsia.
<i>Geoffroya inermis</i> ♀	— 144.	Diadelph. Decand.	Leguminosæ.	....	Jamaica.	Bark.	Anthelmintic.	In worms.
<i>Geum urbanum</i> ♂	i. 36.	Icosand. Polygyn.	Rosacææ.	May, Aug.	Britain.	Root.	Astringent, tonic.	Dysentery, general debility.
<i>Glycyrrhiza glabra</i> ♀ .	iii. 134.	Diadelph. Decand.	Leguminosæ.	August.	S. of Europe.	—	Demulcent.	Coughs, hoarseness.
<i>Gratiola officinalis</i> ♀	i. 33.	Diand. Monogyn.	Personatæ.	June, July.	—	Herb.	Anthelmintic, diuretic.	Worms, dropay.
<i>Guaicum officinale</i> ♀	ii. 90.	Decand. Monogyn.	Rotacææ.	June, Aug.	Jamaica.	Wood & resin.	Stimulant, diaphoretic.	Chronic rheumatism, syphilis.
<i>Helleborus fetidus</i> ♂	i. 21.	Polyand. Polygyn.	Ranunculacææ.	Mar. April.	Britain.	Root.	Cathartic, anthelmintic.	In worms.
— <i>niger</i> ♂ .	— 11.	—	—	Jan. Mar.	Austria.	—	Cathartic, emmenagogue.	Mania, dropay, amenorrhœa.
— <i>Orientalis</i> ♂	ii. 87.	—	—	....	Greece.	—	As above.	As above.
<i>Humulus Lupulus</i> ♂	i. 41.	Pentand. Diœc.	Urticæ.	July.	Britain.	Srobiles.	Narcotic, diuretic.	Gout, rheumatism.
<i>Hyoscyamus niger</i> ♂	— 9.	Pentand. Monogyn.	Luridæ.	—	—	Leaves.	Narcotic.	Epilepsy, hysteria, scirrhus.
<i>Inula Helenium</i> ♂ .	— 49.	Syngenes. Polygyn.	Corymbifera.	July, Aug.	—	—	Tonic, diuretic.	Dyspepsia, dropsies.

Name, Duration, and Habit.	Volume and Plate.	Class and Order.		Time of Flowering.	Native Country.	Parts Used.	Operation.	Uses.
		<i>Linneæ.</i>	<i>Jussieu.</i>					
<i>Iris florentina</i> 24 . . .	i. 27.	Triand. Monogyn.	Iridæ.	May, June.	S. of Europe.	Fresh root.	Cathartic.	In dropæics.
<i>Juniperus communis</i> 12 . .	iii. 141.	Diœc. Monadel.	Conifera.	May.	Britain.	Berries.	Diuretic, carminative.	Dropæics, cutaneous diseases.
<i>Krameria triandra</i> 12 . .	ii. 72.	Tetrand. Monogyn.	Polygalææ.	....	S. America.	Root.	Astringent, tonic.	Dysentery, dyspepsia.
<i>Lactuca virosa</i> 8 . . .	i. 12.	Syngenes. Polygyn.	Cichoracææ.	Aug. Sept.	Britain.	Leaves.	Narcotic, diaphoretic.	Coughs, phthisis.
<i>Laurus Cinnamomum</i> 12 . .	iii. 127.	Eneand. Monogyn.	Holoracææ.	Jan. Feb.	Ceylon.	Bark and Flower buds.	Stimulant, tonic.	Dyspepsia, diarrhœa.
— nobilis 12 . . .	ii. 125.	—	—	April, May.	S. of Europe.	Berries.	Carminative, narcotic.	Flatulent colic, hysteria.
— Sessiflora 12 . . .	iii. 126.	—	—	May, June.	N. America.	Wood, bark.	Diaphoretic, diuretic.	Chr. rheumatism, cutaneous diseases.
<i>Lavandula Spica</i> 12 . . .	i. 40.	Didyn. Gymnosp.	Labiataæ.	July, Sept.	S. of Europe.	Flowers.	Stimulant.	Chiefly as a perfume.
<i>Leontodon Taraxacum</i> 24 . .	— 5.	Syngenes. Polyg. Æq.	Cichoracææ.	April, July.	Britain.	Root & Leaves	Aperient, diuretic.	Chr. hepatitis, dropæy jaundice.
<i>Linum catharticum</i> 12 . . .	— 61.	Pentand. Pentagyn.	Caryophyllææ.	June, Aug.	—	Herb.	Cathartic.	Constipation.
— æstivissimum 12 . . .	—	—	—	July.	—	Seeds and Oil	Demulcent.	In pulmonary complaints.
<i>Lolium temulentum</i> 12 . .	i. 3.	Triand. Trigyn.	Gramina.	—	—	Not used.	Acro-narcotic poison.	Not used medicinally.
<i>Lythrum Salicaria</i> 24 . .	iii. 146.	Dodecand. Monog.	Salicariææ.	July, Aug.	—	Herb.	Astringent, tonic.	Diarrhœa, dysentery.
<i>Marrubium vulgare</i> 24 . .	— 133.	Didyn. Gymnosp.	Labiataæ.	June, Sept.	—	Leaves.	Tonic, laxative.	Asthma, hysteria.
<i>Matonia Cardamomum</i> 24 . .	ii. 106.	Monand. Monogyn.	Cannææ.	April, May.	Malabar.	Seeds.	Carminative, stomachic.	Flatulent colic.
<i>Melaleuca Cajuputi</i> 12 . .	— 84.	Polyadel. Icosand.	Myrti.	....	Amboyna.	Oil.	Stimulant, diaphoretic.	Hysteria, paralysis.
<i>Mentha piperita</i> 24 . . .	i. 45.	Didyn. Gymnosp.	Labiataæ.	Aug. Sept.	Britan.	Leaves.	Stomachic, carminative.	Flatulence, cramp of the stomach.

e, Duration, and Habit.	Class and Order.		Time of Flowering.	Native Country.	Parts Used.	Operation.	Uses.
	Volume and Plate.	<i>Linnaea.</i>					
<i>na Pulegium</i> 24 .	i. 45.	Didyn. Gymnosp.	Sept.	Britain.	Herb.	Stomachic, carminative.	In flatulent colic, hysteria.
<i>- viridis</i> 24 .	—	—	August.	—	—	Stimulant, diaphoretic.	Flatulent colic, anorexia.
<i>anthes trifoliata</i> 24 .	ii. 85.	Pentand. Monogyn.	June, July.	—	Leaves.	Tonic, diuretic.	Intermittents, dyspepsia, herpes.
<i>urialis perennis</i> 24 .	— 78.	Diccc. Enneand.	April, May.	—	—	Acro-narcotic poison.	Not used medicinally.
<i>ordica Elaterium</i> 24 .	i. 34.	Monccc. Monadel.	June, July.	S. of Europe.	Insp. Juice.	Cathartic, hydragogue.	Dropsical.
<i>is nigra</i> 24 .	— 59.	Monccc. Tetrand.	June.	Italy.	Fruit.	Refrigerant, laxative.	Inflammatory fevers.
<i>stica moschata</i> 24 .	ii. 104.	Diccc. Monadel.	....	Moluccas.	Fruit.	Stimulant, narcotic.	Vomiting, diarrhoea.
<i>xydon periferum</i> 24 .	— 102.	Decand. Monogyn.	Aug. Oct.	Mexico.	Balsam.	Stimulant, expectorant.	Chronic asthma, pleets.
<i>lus Pimenta</i> 24 .	— 124.	Icosand. Monogyn.	May, June.	W. Indies.	Berries.	Aromatic, stimulant.	Chiefly as a condiment.
<i>riana Tabacum</i> 24 .	i. 37.	Pentand. Monogyn.	July, Sept.	N. America.	Leaves.	Sedative, diuretic, emine.	Hernia, dropsy.
<i>antha crocata</i> 24 .	— 55.	Pentand. Digyn.	July.	Britain.	....	Acrid, poisonous.	Not used medicinally.
<i>europaea</i> 24 .	— 14.	Diand. Monogyn.	—	S. of Europe.	Oil.	Demulcent, laxative.	Catarrhs, acrid poisons.
<i>ranum vulgare</i> 24 .	iii. 131.	Didyn. Gymnosp.	July, Aug.	Britain.	Leaves.	Stimulant, stomachic.	As a snuff in cephalalgia.
<i>ilis Acetosella</i> 24 .	i. 63.	Decand. Pentagyn.	April.	—	Herb.	Refrigerant.	In febrile complaints.
<i>aver Rhus</i> 24 .	— 31.	Polyand. Monogyn.	June, July.	—	Petals.	Laxative ?	To impart a red colour.
<i>— somniferum</i> 24 .	iii. 159.	—	—	—	Capsules. (opium.)	Anodyne, stimulant, sedative.	To relieve pain, &c.
<i>is quadrifolia</i> 24 .	i. 19.	Octand. Tetragyn.	May.	—	....	Acro-narcotic poison.	Not used medicinally.

Name, Duration, and Habit.	Volume and Plate.	Class and Order.		Time of Flowering.	Native Country.	Parts Used.	Operation.	Uses.
		<i>Linnæus.</i>	<i>Jussieu.</i>					
<i>Passiflora Opopanax</i> L .	ii. 98.	Pentand. Digyn.	Umbellifera.	July.	S. of Europe.	Gum-resin.	Antispasmodic.	In hysteria, chlorosis.
<i>Phellandrium aquaticum</i> ♂	i. 10.	— — —	— — —	June, July.	Britain.	Seeds.	— — — —	— — — —
<i>Pimpinella Anisum</i> ☉ .	iii. 156.	— — —	— — —	—	Egypt.	Seeds.	Carminative.	Dyspepsia, colic.
<i>Pinus Abies</i> L	ii. 75.	Monoc. Monadel.	Conifera.	April.	N. of Europe.	Resin.	Rubefacient.	Catarh. pertussis. phthisis.
— <i>Balsamea</i> L	— 74.	— — —	— — —	May.	N. America.	Balsam.	Stimulant, diuretic.	Leucorrhœa, gleet.
— <i>sylvestris</i> L	— 73.	— — —	— — —	—	Britain.	Turpentine, resin, tar.	As above, anthelmintic.	Rheumatism, tape- worm.
— <i>Larix</i>	— 75.	— — —	— — —	—	—	—	—	—
<i>Piper Cubeba</i> L	iii. 175.	Diand. Trigyn.	Urtica.	— — —	Java.	Dried fruit.	Stimulant, cathartic.	Gonorrhœa.
— <i>nigrum</i> L	— 174.	— — —	— — —	— — —	E. India.	Fruit.	Stimulant, carminative.	Singulus, paralysis.
<i>Pistacia Lentiscus</i> L . .	iii. 130.	Dicc. Pentand.	Terebinthaceæ.	April.	S. of Europe.	Mastic.	Stimulant, diuretic.	Chronic coughs, gleet.
— <i>Terebinthus</i> L . .	— 129.	— — —	— — —	May, June.	—	Turpentine.	As above, cathartic.	Rheumatism, catarrhus vesicæ.
<i>Polygala Senega</i> L . . .	ii. 103.	Diadelph. Octand.	Pedicularæ.	June, Aug.	N. America.	Root.	Sudorific, expectorant.	Rheumatism, asthma.
<i>Polygonum Bistorta</i> L .	i. 47.	Octand. Trigyn.	Polygonæe.	August.	Britain.	—	Astringent, tonic.	Chr. dysentery, and diarrhœa.
<i>Prunus Lauro-cerasus</i> L .	ii. 117.	Icosand. Monogyn.	Rosacæe.	April, May.	Levant.	Leaves.	Sedative, antispasmodic.	Coughs, dyspepsia, angina pectoris.
<i>Pterocarpus erinaceus</i> L .	iii. 163.	Diadelph. Decand.	Leguminosæ.	December.	Africa.	Kino.	Astringent.	Diarrhœa, hæmorrh- gies.
<i>Punica Granatum</i> L . . .	i. 57.	Icosand. Monogyn.	Myrti.	July, Sept.	S. of Europe.	Bark and Flowers.	— — — —	Diarrhœa, dysentery.
<i>Pyrola umbellata</i> L . . .	ii. 93.	Decand. Monogyn.	Ericæ.	June.	N. America.	Herb.	Tonic, diuretic.	Acute rheumatism, dropsy.

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		<i>Linnæus.</i>	<i>Jussieu.</i>					
'yrus Cydonia $\frac{1}{2}$. . .	ii. 115.	Icosand. Pentagyn.	Rosaceæ.	May, June	Germany.	Seeds.	Demulcent.	Aphthæ, coughs.
Quassia amara $\frac{1}{2}$. . .	iii. 172.	Decand. Monogyn.	Magnoliæ.	July.	Surinam.	Wood.	Tonic, stomachic	In bilious fever, hysteria, gout.
— excelsa $\frac{1}{2}$. . .	— 173.	—	—	Oct. Nov.	Jamaica.	—	As above.	As above.
— Simaruba $\frac{1}{2}$. . .	— 171.	—	—	Nov. Dec.	S. America.	Bark & Wood.	Tonic.	As above; dyspepsia.
Quercus infectoria $\frac{1}{2}$. . .	— 152.	Monœc. Polyand.	Amentaceæ.	— — —	Asia.	The Galls.	Astringent.	Intestinal hæmorrhages, piles.
— Robur $\frac{1}{2}$. . .	— 151.	—	—	April.	Britain.	Bark.	Astringent, tonic.	Intermittents, fluor albus.
Ranunculus acris $\frac{1}{4}$. . .	ii. 82.	Polyand. Polygyn.	Ranunculaceæ.	June, July.	—	Leaves.	Rubefacient, epispastic.	As counter-irritants.
— Flammula $\frac{1}{4}$. . .	— —	—	—	— Aug.	—	Fresh Herb.	As above.	The same as R. acris.
Rhamnus catharticus $\frac{1}{2}$. . .	ii. 119.	Pentand. Monogyn.	Rhamn.	May.	—	Berries.	Violently cathartic.	Dropsies, worms.
Rheum palmatum $\frac{1}{4}$. . .	i. 25.	Enneand. Monog.	Polygonææ.	—	Tartary.	Root.	Cathartic, astringent.	Constipation.
— undulatum $\frac{1}{4}$. . .	iii. 177.	—	—	—	China.	—	As above.	As above.
Rhododendron chrysanthum $\frac{1}{2}$. . .	ii. 80.	Decand. Monogyn.	Rhododendra.	June, July.	Siberia.	Leaves.	Stimulant, narcotic.	Rheumatism, gout.
Rhus toxicodendron $\frac{1}{2}$. . .	iii. 167.	Pentand. Trigyn.	Terebintaceæ.	—	N. America.	—	As above.	Paralysis, herpes.
Ricinus communis ☉ . . .	i. 50.	Monœc. Monadel.	Euphorbiæ.	August.	Both Indies.	Seeds & Oil.	Cathartic.	Constipation.
Rocella tinctoria $\frac{1}{4}$. . .	ii. 69.	Cryptogam. Algæ.	Lichenes, Hoff.	— — —	Britain.	Herb.	— — —	Phthisis, and for preparing Litmus.
Rosa canina $\frac{1}{2}$. . .	— 100.	Icosand. Polygyn.	Rosaceæ.	June.	—	Pulp.	Laxative.	For making the Confection.
— gallica $\frac{1}{2}$. . .	— 99.	—	—	June, July.	S. of Europe.	Petals.	Astringent.	As a vehicle; and in diarrhœa.

Name, Duration, and Habit.	Volume and Plate.	Class and Order.		Time of Flowering.	Native Country.	Parts Used.	Operation.	Uses.
		<i>Linneæ.</i>	<i>Jussieu.</i>					
Rosmarinus officinalis L.	i. 24.	Diand. Monogyn.	Labiata.	Feb. Mar.	—	Tops.	Stimulant.	Nervous headache, chlorosis.
Rumex Hydrolepathum L.	iii. 133.	Hexand Trigyn.	Polygonæ.	July, Aug.	Britain.	Root.	Astringent.	In ichthyosis, lepra.
Ruta graveolens L.	ii. 71.	Decand. Monogyn.	Rutacæ.	June, Sept.	S. of Europe.	Leaves.	Stimulant, antispasmodic.	Hysteria, convulsions.
Saccharum officinarum L.	iii. 148.	Triand. Digyn.	Gramina.	....	E. Indies.	Sugar.	Laxative; eucharotic.	Antidote for verdigris.
Salix Russeliiana L.	iii. 139.	Diœc. Diand.	Amentacæ.	April, May.	Britain.	Bark.	Tonic, astringent.	Intermittents; general debility.
Sambucus nigra L.	ii. 79.	Pentand. Trigyn.	Caprifoliæ.	July.	—	Flowers, berries and bark.	Bark; cathartic.	Dropsy, hemorrhoids.
Scilla maritima L.	iii. 153.	Hexand. Monogyn.	Asphodeli.	April, July.	S. of Europe.	Bulb.	Diuretic, expectorant.	Asthma, pertussis, dropsy.
Secale cereale C.	ii. 113.	Triand. Digyn.	Gramina.	July.	Crete?	Spur, or Ergot.	Stimulant; septic.	To accelerate parturition.
Secale cornutum.								
Sinapis alba C.	i. 42.	Tetradyn. Siliq.	Crucifæræ.	June.	Britain.	Seeds.	Stimulant; emetic; rubefacient.	Dyspepsia, chlorosis, apoplexy.
—nigra C.								
Smilax Sarsaparilla L.	iii. 162.	Diœc. Hexand.	Asparagi.	July, Aug.	S. America.	Root.	Demulcent, alterative.	Syphilis, elephantiasis.
Solanum Dulcamara L.	i. 17.	Pentand. Monogyn.	Solanæ.	June, Aug.	Britain.	Stalks.	Narcotic, sudorific.	Lepra, asthma.
Solidago Virgaurea L.	ii. 105.	Syngenes. Polyg. S.	Corymbifæræ.	July, Sept.	—	Flowers and leaves.	Astringent, tonic.	Chr. dysentery, urinary calculus.
Spartium scoparium L.	ii. 67.	Diadelph. Decand.	Leguminosæ.	May, June.	—	Tops & seeds.	Diuretic; emetic.	Dropsies.
Spigelia marilandica L.	i. 7.	Pentand. Monogyn.	Gentianæ.	July.	N. America.	Root.	Anthelmintic.	Worms.
Strychnos Nux-vomica L.	i. 52.	— — —	Luridæ.	....	India.	Seeds.	Tonic; poisonous,	Dyspepsia; paralysis.

Name, Duration, and Habit.	Class and Order.		Time of Flowering.	Native Country.	Parts Used.	Operation.	Uses.
	Volume and Plate.	Linnaea.					
rax benzoin ℥ .	ii. 112.	Decand. Monogyn.	Guaiacinae.	Sumatra.	Balsam.	Expectorant?	Asthma, and for preparing the acid.
rax officinale ℥ .	i. 47.	Decand. Monogyn.	Guaiacinae.	Italy.	Balsam.	Stimulant.	In chr. catarrh, asthma.
ietenia febrifuga ℥ .	ii. 81.	— — — —	Meliaceae.	E. Indies.	Bark.	Astringent, tonic.	Intermittent fevers.
marindus indica ℥ .	— 88.	Monadel. Triand.	Leguminosae.	Both Indies.	Preser. fruit.	Refrigerant, laxative.	Inflammatory fevers.
nacetum vulgare ʒ .	ii. 116.	Syngenes. Polyg. S.	Corymbiferae.	Britain.	Leaves.	Tonic, anthelmintic.	Hysteria, gout, worms.
mentilla erecta ʒ .	i. 26.	Icosand. Polygn.	Rosaceae.	....	Root.	Astringent.	Diarrhea in phthisis.
iticum hybernium ☉ .	ii. 113.	Triand. Digyn.	Graminae.	Asia.	Starch.	Demulcent.	Dysentery, tenesmus.
ssalago Farfara ʒ .	i. 20.	Syngenes. Polyg. S.	Corymbiferae.	Britain.	Leaves.	Demulcent.	Coughs; cutaneous diseases.
aleriana officinalis ʒ .	i. 54.	Triand. Monogyn.	Dipsaceae.	—	Roots.	Antispasmodic.	Epilepsy, hysteria.
eratrurn album ʒ .	iii. 136.	Polygam. Monoc.	Junci.	Europe.	Root.	Emetic; errhine.	Mania, apoplexy; scabies.
iola odorata ʒ .	i. 29.	Pentand. Monogyn.	Cysti.	Britain.	Recent flower.	Slightly laxative.	As a test of acids.
itis vinifera ℥ .	iii. 140.	— — — —	Vitis.	Greece.	Raisins, wine	Laxative; cordial.	In typhus, &c.
linus campestris ℥ .	ii. 120.	Pentand. Digyn.	Amentaceae.	Britain.	Bark.	Tonic; alterative.	Chronic cutaneous diseases.
Ninters aromatica ℥ .	iii. 178.	Polyand. Trigyn.	Magnoliae.	Terra del Fuego.	Bark.	Tonic; carminative.	Colic, dyspepsia.
ingiber officinale ʒ .	ii. 96.	Monand. Monogyn.	Cannae.	E. Indies.	Root.	Stimulant, carminative.	Colic, dyspepsia, gout.

G L O S S A R Y

OF

TERMS USED IN THE GENERIC AND SPECIFIC DESCRIPTIONS.

Acini, the small grains, or berries which compose the fruit of the Mulberry, Bramble, &c.

Aculeate, furnished with *aculei*, or prickles.

Acuminate, pointed; ending in an awl-shaped point.

Adnate, adhering to any thing; close pressed.

Aggregate, collected in a heap or head.

Aggregate flower, composed of several little flowers, or florets, on a common receptacle, and inclosed within one common calyx; as in the Dandelion.

Albumen, the substance which makes up the chief bulk of some seeds, as Grasses.

Alternate leaves or branches, rising singly, one above another.

Amentum. See *Catkin*.

Amplexicaul, clasping the stem. Ex. *Lactuca virosa*.

Annual, plants that live but one year.

Anther, a cellular body placed on the summit of the stamens, and containing the pollen.

Arillus, the proper exterior coat of a seed, that falls off spontaneously.

Arrow-shaped leaf. Ex. *Rumex Acetososa*.

Awl-shaped, gradually tapering to a sharp point.

Awn, a bristle-shaped appendage arising from the glume or chaff in corn and Grasses.

Barren flowers, are those that have no pistils.

Berry, a succulent fruit that contains many seeds; as in *Atropa Belladonna*.

Biennial, vegetating only two years.

Bilobed, having two lobes, or rounded margins.

Bipartite, divided into two parts.

Bipinnate, when two leaflets proceed laterally from one footstalk.

Brachiate, or four ranked, branching alternately in pairs.

Bractea, a floral leaf, attached close to the flower or its stalk.

Bulb, a fleshy mass, usually coated, having small radicles attached to its base; as in the Squill and Onion.

Caducous, soon falling off.

Calyx, the flower-cup; the coloured leaves which inclose the flower, or parts of fructification.

Capsule, a seed-vessel, which generally splits into several valves, and contains many seeds; as in the Poppy and Stramonium.

Carina, the keel, the lower petals of a papilionaceous corolla.

Catkin, (*amentum*), a long simple stem, covered with scales, under which the flowers are concealed.

Cauline, (*caulis*, the stem,) belonging to the stem.

Ciliate, furnished with short parallel bristles.

Cluster, see *Raceme*.

Common Calyx, a calyx which contains many flowers; as in *Leontodon Taraxacum*.

Compound flower, when several florets are inclosed in one calyx, and having their anthers united into a cylinder; as in *Leontodon*, *Carduus*, *Tanacetum*.

Cons. (*strobilus*), a catkin, the scales of which have become enlarged and woody, as in *Pinus*.

Cordate, heart-shaped.

Corolla, the coloured leaf, or leaves surrounding the interior parts of the flower, and inclosed by the calyx.

Corymb, a mode of inflorescence, when the flowers have each their proper footstalks of an equal height, forming a flat surface.

Cotyledon, a seed-lobe.

Crenate, notched; when the margin of a leaf is cut into teeth that are rounded, and not directed towards either end of the leaf.

Culm, (*culmus*, straw,) the proper stem of grasses.

Deciduous, leaves that fall off on the approach of winter.

Decurrent, running down; when the base of a sessile leaf extends itself downwards along the stem or branch, as *Centaurea benedicta*.

Dichotomous, forked, dividing in pairs.

Dioecious, bearing male and female flowers on different plants.

Disc, the central part of a compound radiate flower.

Drupe, a nut covered with a fleshy, succulent or cartilaginous coat; as in the Plum, Almond, &c.

Elliptic leaf, oval; of equal breadth at each end.

Emarginate, notched at the end.

Entire, without notches or teeth.

Epidermis, the external skin.

Eserted, standing forth, as when the stamens appear above the corolla.

Female flowers, where there are no stamens.

Fertile flowers, where the stamens and pistils are situated in different flowers, that which has pistils is called the fertile flower, as bearing the seed.

Filament, the thread-like part of a stamen, supporting the anther.

Florets, little flowers.

Flower, is usually defined that part of a plant, which is destined for the production of the fruit and seeds.

Fronde, the leaf of the Fern and Lichen tribe.

Fructification, the flowers and fruit.

Fungi, mushrooms. Ex. *Agaricus*.

Fusiform, spindle-shaped, tapering; as in the Carrot.

Germen, the base of the pistil, the rudiment of the fruit.

Gibbous, swollen.

Gills (*lamellæ*), the thin plates on the under side of the *Fungi*.

Gland, a little tumour secreting a fluid.

Glaucous, of a sea-green colour.

Glume, the peculiar calyx of grasses, called the *husk*, or *chaff*, when dry.

Herbaceous, perennial plants, which annually perish down to the root.

Hermaphrodite flowers, where there are both stamens and pistils.

Hymenium, the membrane in mushrooms, in which the seeds are imbedded.

Imbricated, laid one over another, like the tiles on a house.

Involucella, the small leaves accompanying the partial umbel.

Involucrum, the small leaves at the base of an umbel.

Lacinia, segments or incisions.

Lamella. See *Gills*.

Lanceolate, spear-shaped; attenuated at both extremities.

Leaflet, a diminutive of leaf; put for the component leaf, in compound leaves.

Leaves, are generally membranous, greenish bodies, pulpy, and vascular, sometimes very succulent, produced on different parts of the stem.

Legume, a dry, elongated seed-vessel of two valves, to the margin of the under surface of which the seeds are attached.

Ligulate, shaped like a strap or ribbon; as the florets of the Dandelion.

Limb, the upper expanded part of a monopetalous corolla.

Linear, equal in breadth throughout.

Male flowers, containing stamens, but no pistil.

Monacious (*monæci*), having stamens and pistils in different flowers, but growing on the same plant.

Monopetalous, consisting of one petal.

Mucronate (*mucronatum* or *Cuspidatum*), sharp-pointed; tipped with a rigid spine; as in *Pistacia Lentiscus*.

Nectary, that part of the corolla which either secretes the honey, or serves to protect various parts of the plant.

Nut, a seed covered with a hard shell, that does not separate into distinct valves.

Officinal, plants used in medicine, and kept in the shops.

Oblong, three or four times longer than broad.

Obovate, of the shape of an egg cut lengthwise, with the broad end uppermost.

Opposite, growing in opposite pairs.

Ovate, of the shape of an egg cut lengthwise.

Ovate-oblong, oblong egg-shaped.

Palmarate, cut into several equal segments, leaving an entire space like the palm of the hand.

Panicle, a loose spike of flowers variously subdivided.

Papilionaceous, resembling a butterfly. Ex. *Dolichos*.

Pappus, the seed down; as in the Dandelion.

Peduncle, the flower-stalk, supporting the fructification only.

Pedicel, a partial flower-stalk.

Perennial, continuing several years.

Pericarpium, the seed-vessel.

Petal, the coloured leaf, or leaves of the corolla.

Petiole, a foot-stalk, or leaf-stalk.

Pileus, a hat, the broad part, in the Agaric tribe, which covers the fructification.

Pinnate leaf, a compound leaf, having a simple petiole, connecting two rows of leaflets.

Pistil, a small columnar body standing in the middle of the stamens, which is essential to fructification.

Pollen, the fine powder contained in the anther, and designed for the impregnation of the germen.

Pubescent, covered with hairs.

Raceme, consists of a number of petioled flowers connected together by one common stalk; as a bunch of Grapes.

Radical, springing from the root.

Radius, the Ray, the marginal florets of a compound flower.

Ray, the flower-stalk of an umbel.

Receptacle, the base connecting the other parts of the fructification.

Rhomboid, or diamond-shaped. Ex. *Chenopodium olidum*.

Runcinate, or lion-toothed, cut into several transverse, acute segments, pointed backwards; as in *Leontodon Taraxacum*.

Scabrous, rough with tubercles.

Scape, a stalk bearing the flowers and fruit, but not the leaves.

Serrate, toothed like a saw.

Sessile, sitting close, without any foot-stalk.

Sheath, a prolongation of the leaf, which rolls itself around the stem, and forms a cylinder; as in all the Grasses.

Siliqua, a Pod, consisting of two valves, to the inner margins of both sutures of which the seeds are attached; as in *Sinapis*.

Sinuato, scalloped; as the leaf of the Oak.

Spadix, an elongated receptacle, inclosed in the spathe; as in *Arum*.

Spathe, (*spatha*), a kind of calyx, bursting horizontally in the form of a sheath. Ex. *Arum maculatum*.

Spike, where numerous florets sit on a simple flower-stalk; as in *Lavandula Spica*.

Spikelet, or **Spicule**, a partial spike, or subdivision of a spike.

Sporæ, the seeds of Fungi.

Stamen, an organ in flowers, commonly of a thread-like form, bearing the anther.

Stigma, the top of the pistil.

Stipes, the stem of a mushroom.

Stipula, or **Stipule**, a leafy appendage at the base of the foot-stalks, or leaves.

Strobile. See *Cone*.

Style, the middle part of the pistil connecting the stigma with the germen.

Tendril (*cirrus*), or **Clasper**, a filiform slender body, by which a weak plant supports itself on other bodies; as the Vine.

Ternate, having three leaflets on one petiole.

Thallus, same as *Frond*.

Tomentose, downy.

Trifid, 3-cleft, or cloven into three parts.

Truncate, cut off in the end, by a transverse line.

Umbel, several flower-stalks of equal length, that rise from a common centre, like the sticks of an umbrella.

Valve, the outer covering of a seed-vessel, or the several pieces which compose it.

Verticillate Plants, having the flowers growing in a whorl.

Vexillum, the standard, the upper large petal of a papilionaceous flower.

Villous, covered with soft hairs.

Volva, the wrapper, the covering which surrounds the young Fungus, and bursting, forms a ring upon the stalk.
Ex. *Agaricus*.

Whorl, a mode of inflorescence, in which several flowers surround the stem or branch in a ring.

ABBREVIATIONS

OF

WORDS AND TITLES OF BOOKS EXPLAINED.

- Achar. Lichen. Univ.*—ACHARIUS (Erick). Lichenographia Universalis. 1 vol. 4to. Gottingen, 1810.
- Achar. Meth. Lich.*—ID. Methodus quæ omnes detectos Lichenes ad genera, &c. redigere tentavit. 1 vol. 8vo. Stockholm, 1803.
- Achar. Prodr.*—ID. Lichenographie Suecicæ Prodromus. 1 vol. 8vo. 1798.
- Acta Berol.*—Mémoires de l'Académie Royale des Sciences de Berlin. 4to. Berlin, 1770-1816.
- Acta Erud.*—Acta Eruditorum quæ Lipsiæ publicantur. 50 vols. 4to. 1682-1731.
- Acta Harlem.*—Verhandelingen uitgeeven door te Hollandse Maatschappijder weeten schappen te Haarlem. 8vo. 1754, et seq.
- Acta Helvet.*—Acta Helvetica physicomathematico-botanico-medica. 8 vols. 4to. Basil, 1757-1777.
- Acta Holm.*—Kongl. svenska vetenskaps akademien Handlingar. 8vo. Stockholm, 1739-1816.
- Acta Paris.*—Mémoires de l'Académie Royale des Sciences. 1 vol. 4to. 1666-1788.
- Acta Societ. Batav.*—Verhandelingen van het Bataviaasch Genootschap der Konstan an wetenschappen. 6 vols. 8vo. Rotterdam, 1779-1792.
- Acta Suec.*—Acta Literaria Suecica. 1 vol. 4to. Upsal, 1720-1724.
- Acta Upsal.*—Acta Literaria et Scientiarum Upsaliæ publicata. 8vo. 1720-1816.
- Ait. Hort. Kew.*—AITON (William). Hortus Kewensis, ed. 2d. 5 vols. 8vo. London, 1810.
- Allion. Ped.*—ALLIONI (Charles). Flora Pedemontana. 3 vols. folio, Turin, 1785.
- Alpin. Egypt.*—ALPINUS (Prosper). De Plantis Egypti liber. 4to. Venice, 1592.
- Alpin. Exot.*—ID. De Plantis exoticis libri duo. 4to. Venice, 1656.
- Amm. Ruth.*—AMMAN (John). Stirpium rariorum in Imperio Rutheno sponte provenientium Icones et Descriptiones. 4to. Petersburg, 1739.
- Amæn. Acad.*—Linnei Amœnitates Academicæ, seu Dissertationes antehac seorsim editæ. 10 vols. 8vo. Stockholm and Leipsic, 1749, et seq.
- Andrew's Repos.*—ANDREWS (Henry). The Botanist's Repository. 10 vols. 4to. London, 1797, &c.
- Ann. de Chim.*—Annales de Chimie, &c. 99 vols. 8vo. Paris, 1789-1829.
- Asiat. Res.*—Asiatic Researches, or the Transactions of the Society instituted in Bengal. 4to. Calcutta, 1788, &c.
- Aublet. Guia.*—AUBLET (Fusée). Histoire des Plantes de la Guiane Française. 4 vols. 4to. London, 1773.
- Barrel. Ic.*—BARRELIER (James). Plantæ per Galliam, Hispaniam, et Italiam Observatæ, Iconibus æneis exhibitæ. 3 vols. fol. Paris, 1714.
- Batsch. Fung.*—BATSCH (Aug. John George Charles). Elenchus Fungorum. 4to. Halle, 1783-1789.
- Bauh. Hist.*—BAUHIN (John). Historia Plantarum Universalis. 3 vols. fol. Yverdun, 1650.
- Bauh. Pin.*—BAUHIN (Casper). Pinax Theatri Botanici. 4to. Basil, 1671.
- Berg. Mat. Med.*—BERGIVS (Peter Jo-

- nas) *Materia Medica e Regno Vegetabili*. 3 vols. 8vo. Stockholm, 1778.
- Berlin Mag.*—*Berlinischer Magazin, oder gesammte Schriften*. 4 vols. 8vo. Berlin, 1765-1767.
- Bigel. Amer. Med. Bot.*—*BIGELOW* (Jacob). *American Medical Botany*. 3 vols. 4to. Boston, 1818.
- Blackw.*—*BLACKWELL* (Eliz.). *A curious Herbal containing 600 cuts of the useful plants*. 2 vols. fol. London, 1737.
- Bolt Fung.*—*BOLTON* (James). *A History of Funguses growing about Halifax*. 4to. Huddersfield, 1788-1791.
- Bot. Mag.*—*The Botanical Magazine*. 8vo. 56 vols. London, 1787-1830.
- Bot. Reg.*—*The Botanical Register*. 8vo. 15 vols. London, 1815-1830.
- Browne Jam.*—*BROWNE* (Patrick). *The Civil and Natural History of Jamaica*. fol. London, 1756.
- Brotero Lusit.*—*BROTERO* (Felix Avelar). *Phytographiæ Lusitanicæ selectior*. fol. Lisbon, 1800.
- Bull. Champ.*—*BULLIARD*. *Histoire des Champignons de la France*. fol. Paris, 1798.
- Bull. Fr.* See *Fl. Franc.*
- Burm. Zeylan.*—*BURMANN* (John). *The-saurus Zeylanicus*, 4to. Amsterdam, 1737.
- Camer. Epit.*—*CAMERARIUS* (Joachim). *De Plantis Epitome*. 4to. Franckfort. 1586.
- Catesb. Carol.*—*CATESBY* (Mark). *The Natural History of Carolina, Florida, &c.* 2 vols. fol. London, 1741-1743.
- Clus. Exot.*—*CLUSIUS* (Charles). *Exoticarum libri X*. fol. Antwerp, 1605.
- Clus. Hist.*—*Id.* *Rariorum Plantarum Historia*. fol. Antwerp, 1601.
- Com. Gott.*—*Commentarii Societatis Regiæ Scientiarum Göttingensis*. 4to. 1751-1816.
- Column. Phytob.*—*COLUMNA* (Fabius). *Phytobassanos*, 4to. Naples, 1592.
- Commel. Hort.*—*COMMELYN* (Caspar). *Horti Medici Amstelodamensis Rariorum Plantarum descriptio et Icones*. 2 vols. fol. Amsterdam, 1703.
- Cornut. Canad.*—*CORNUTUS* (Jacob). *Canadensium Plantarum aliarumque nondum editarum Historia*. 4to. Paris, 1635.
- Dale Pharm.*—*DALE* (Samuel). *Pharmacologia*. 4to. London, 1737.
- Dalech. Hist.*—*DALECHAMPS* (James). *Historia generalis Plantarum*. 2 vols. fol. Lyons, 1587.
- Dalib. Paris.*—*DALIBARD*. *Flora Parisiensis*. 12mo. Paris, 1719.
- Decand. Astrag.*—*DECANDOLLE* (Augustus Pyramus). *Astragalogia*. 1 vol. fol. Paris, 1802.
- Decand. Pl. Grass.*—*Id.* *Plantarum Historia succulentarum*. fol. Paris, 1799-1803.
- Decand. Prodr.*—*Id.* *Prodromus Systematis Naturalis Regni Vegetabilis*. 2 vols. 8vo. Paris, 1824.
- Desfont. Fl.*—*DESFONTAINES* (René). *Flora Atlantica*. 2 vols. 4to. Paris, 1798.
- Dicks. Crypt.*—*DICKSON* (James). *Plantarum Cryptogamicarum Britannicæ Fasciculi*. 3 vols. 4to. London, 1785-1793.
- Dill. Musc.*—*DILLENIUS* (John James). *Historia Muscorum*. 4to. Oxford, 1741.
- Diosc.*—*Dioscoridis libri 8*, Gr. et Lat. a Ruellio. 12mo. 1549.
- Dod. Pempt.*—*DODONEUS* (Rembert). *Stirpium Historia Pemptades Sex*. fol. Antwerp, 1616.
- Duham. Arbr.*—*DUHAMEL DU MONCEAU* (Henry Louis). *Traité des Arbres et Arbustes qui se cultivent en France en pleine Terre*. 2 vols. 4to. Paris, 1755.
- Ehrh. Pl. Off.*—*EH RHART* (Frederick). *Plantæ Officinales, quas in usum studiorum Medicinæ, Chirurgicæ et Pharmaceuticæ collegit et exsiccat*. fol. 60 decades. Hanover, 1785.
- Eng. Bot.*—*SMITH* (James Edward). *English Botany; the figures by James Sowerby*. 36 vols. 8vo. London, 1790-1814.
- Eph Nat. Cur.*—*Academiæ Naturæ Curiosorum Ephemerides*, 4to. Franckfort, Jena, Leipsic, Nuremberg, or Vienna. 1670-1722.
- Esper. Icon. Fuc.*—*ESPER* (Eug. Jos. Christ.). *Icones Fucorum Abbildungen der Tange*. 4to. Nuremberg, 1797-1799.
- Ferr. Hesp.*—*FERRARI* (John Baptist). *Hesperides sive de malorum aureorum culturâ et usu*. fol. Rome, 1646.

Fl. Brit.—SMITH (James Edward). *Flora Britannica*. 3 vols. 8vo. London, 1804-1804.

Fl. Dan.—Icones Plantarum sponte nascentium in regnis Daniæ et Norvegiæ, &c. 9 vols. fol. Copenhagen, 1761-1829.

Fl. Franc.—BULLIARD. *Herbier de la France*. fol. Paris, 1786.

Fl. Græc. Sibth.—SIBTHORP (John). *Flora Græca* ed. J. E. Smith. 6 vols. fol. London, 1806-1829.

Fl. Peruv.—RUIZ (Hippol.) et PAVON (Jos.). *Flora Peruviana et Chilensis*. 3 vols. fol. Madrid, 1798-1799.

Forsk. Fl.—FORSKAL (Peter). *Flora Egyptiaco-Arabica*, ed. Niebuhr. 4to. 1775.

Fries Syst. Myc.—FRIES (Elias). *Systema Mycologicum sistens Fungorum, ordines, genera et species, huc usque cognitæ*, &c. 8vo. Lund, 1821.

Fuch. Hist.—FUCHSIUS (Leonhard). *De Historiâ stirpium commentarii insignes*. fol. Basil, 1542.

Gartn. de Fruct.—GERTNER (Joseph). *De Fructibus et Seminibus Plantarum*. 2 vols. 4to. Stutgard, 1788-1799.

Gater. Montaub.—GATARAU. *Description des Plantes qui croissent aux environs de Montauban*. 1 vol. 8vo. Montauban, 1789.

Geoff.—GROFFROY. *Traité de Matière Médicale*. 16 vols. 12mo. Paris, 1757.

Ger. Em.—GERARD (John). *Herball or General Historie of Plants*, enlarged and amended by T. Johnson. fol. London, 1636.

Gmel. Flor. Sib.—GMELIN (John George). *Flora Sibirica*. 4 vols. 4to. Petersburg, 1747-1769.

Gmel. Hist. Fuc.—GMELIN (Sam. Gottl.). *Historia Fucorum*. 4to. Petersburg, 1768.

Gouan. Hort.—GOUAN (Antony). *Hortus Regius Monspelienensis*. 8vo. Lyons, 1762.

Gray Nat. Arr.—GRAY (Sam. F.). *Natural Arrangement of British Plants*. 2 vols. 8vo. London, 1821.

Grev. Crypt. Fl.—GREVILLE (Charles Kaye). *The Scottish Cryptogamic Flora*. 6 vols. 8vo. Edinburgh, 1822-1828.

Grev. Fl. Edin.—Id. *Flora Edinensis*. 8vo. Edinburgh, 1824.

Gron. Fl. Virg.—GRONOVIVS (J. Fred.). *Flora Virginica*. Leyden, 4to. 1762.

Hall. Hist.—HALLER (Albert von). *Historia Stirpium Indigenarum Helvetiæ*. 3 vols. fol. Bernæ, 1768.

Hall. Opusc.—Id. *Opuscula Botanica*. 8vo. Gottingen, 1749.

Herm. Prodr.—HERMANN (Paul). *Paradisii Batavi prodromus*. ed. E. War-ton. 12m. Amsterdam, 1689.

Hernand. Mexic.—HERNANDEZ (Francis). *Nova Plantarum, Animalium, et Mineralium Mexicanorum Historia*. fol. Rome, 1651.

Hoffm. Pl. Lich.—HOFFMAN (George Francis). *Plantæ Lichenosæ*. 2 fasc. fol. Leipsic, 1789-1791.

Hook. Bot. Misc.—HOOKER (William Jackson). *The Botanical Miscellany*. 8vo. London, 1829-1830.

Hook. Exot.—Id. *Exotic Flora*. 3 vols. 8vo. Edinburgh, 1825-1827.

Hook. Scot.—Id. *Flora Scotica*. 8vo. London, 1821.

Hort. Cliff.—LINNEUS (Charles). *Hortus Cliffortianus*. fol. Amsterdam, 1737.

Hort. Berol.—WILLDENOW (Charles Lewis). *Hortus Berolensis*. fol. Berlin, 1806-1810.

Hort. Kew.—See *Ait. Hort. Kew.*

Host. Gram.—HOST (Nicholas Thomas). *Icones et Descriptiones Graminum Austriacorum*. 4 vols. fol. Vienna, 1801-1809.

Huds. Fl. Angl.—HUDSON (William). *Flora Anglica*. 2 vols. 8vo. ed. 2. London, 1778.

Hughes Barb.—HUGHES (Griffith). *The Natural History of Barbadoes*. fol. London, 1750.

Humb. Pl. Æq.—HUMBOLDT (Alexander, Baron de) et BONPLAND (Amie). *Plantes Equinoxiales*. 2 vols. fol. Paris, 1808-1816.

Jacq. Amer.—JACQUIN (Nicholas Joseph von). *Stirpium Americanarum Historia*. fol. 1763.

Jacq. Austr.—Id. *Floræ Austriacæ*, Icones. 5 vols. fol. Vienna, 1773-1778.

Jacq. Coll.—Id. *Collectanea ad Botanicam, Chemiam et Historiam Natu-*

- relem apocantia*. 5 vols. 4to. Vienna, 1786-1796.
- Jacq. Hort. Vind.*—ID. *Hortus Botanicus Vindobonensis*. 3 vols. fol. Vienna, 1764-1776.
- Kempf. Exst.*—KEMPFER (Englebert). *Amenitates Exoticæ*. 4to. 1712.
- Lam. Dict.*—LAMARCK (Chevalier de). *Dictionnaire Encyclopédique de Botanique*. 8 vols. 4to. Paris, 1769-1800.
- Lamarck, Ill.*—LAMARCK (Jean Baptiste Monet de la). *Illustration des Genères*. 4to. Paris, 1791, &c.
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Fr. French.

It. Italian.

Sp. Spanish.

Port. Portuguese.

Ger. German.

Dut. Dutch.

Swed. Swedish.

Dan. Danish.

Hind. Hindoostanie.

Tam. Tamool.

Chin. Chinese.

Arab. Arabic.

Sans. Sanscrit.

Cing. Cingalese.

Mal. Malay.

Jav. Javanese.

Tel. Telingoo.

Jap. Japanese.

Beng. Bengalie.

Coch. Chin. Cochinchina.

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